The Journal of the American Medical Association

Published under the Auspices of the Board of Trustees

VOL. XLIII. CHICAGO, ILLINOIS, OCTOBER 1, 1904. No. 14.

Original Articles.

PLEURAL EFFUSION IN HEART DISEASE.*

J. DUTTON STEELE, M.D.

Associate in Medicine, University of Pennsylvania; Bacteriologist to the Presbyterian Hospital.

(From the Department of Clinical Medicine, University of Pennsylvania.)

PHILADELPHIA.

In a paper entitled "The Distribution and Etiology of Cardiac Hydrothorax," which was published in 1897, I called attention to the fact that passive pleural effusion may occur in the course of failing compensation of the heart, before there is any tendency to external dropsy, and that this pleural effusion is very often unilateral, with a preference for the right side. That paper contained an analysis of the autopsies of 75 cases of hydrothorax occurring in patients with undoubted disease of the heart muscle. It was shown that in three-fourths of these cases the effusion was greater on one side than on the other, and in one-fifth the effusion was unilateral. The greater amount of fluid was on the right side in three-fourths of the unequal effusions and in 10 of the 13 cases of the unilateral effusions the fluid was found in the right pleural sac.

The material for my table was obtained from the notes of 2,427 autopsies contained in the records of the Philadelphia Hospital, and of the Middlesex Hospital in London. I also published the clinical notes of 4 cases from the wards of Dr. Stengel and Dr. Packard that showed this right-sided hydrothorax. In all of these cases the formation of the effusion preceded the edema, and I called attention to the fact that such effusions may precede external edema.

Dr. Stengel (University of Pennsylvania Medical Bulletin, 1901), took up the subject in a paper published in 1901, and gave an analysis of seventeen instances of hydrothorax which occurred in 100 consecutive cases of cardiac disease. His conclusions are probably of more value than those of my first paper, although mine were obtained from the autopsies of many more cases; because Stengel's analysis was based on clinical notes of living patients, while mine were all fatal cases; for it will be readily understood that in autopsy findings the sequence of events of the morbid state can not be accurately determined. Consequently, it was impossible to tell from autopsy notes whether in double effusion the fluid had been unilateral at the onset or not, and it was usually quite impossible to tell whether or not the pleural effusion had preceded general edema and effusions into other serum cavities.

In the 17 cases of hydrothorax that Stengel gives, the effusion was confined to the right side at some time in the course of the disease in 7 cases; 7 more were bilateral, with greater involvement of the right side, and in 3 cases the effusion was entirely left sided. In 8 of Stengel's 17 cases edema was absent or slight.

The literature of the subject has been fully considered in the papers by Dr. Stengel and myself. It is sufficient to say that several writers of text-books, including Pepper, Osler, Baccelli, and Rosenbach, state that cardiac hydrothorax is apt to occur before general edema, and is then unilateral with preference to the right side. Many observers have reported isolated cases of right-sided cardiac hydrothorax, and a group of Italians, including Piazza-Martini, Villani, Lizzato Cardenelli and Peter, have called attention to the occasional occurrence of right-sided pleural effusion of a non-inflammatory nature in atrophic cirrhosis of the liver. But so far as can be determined there has been no attempt made to consider the distribution or etiology of cardiac hydrothorax by an analysis of a series of cases before the subject was taken up by Dr. Stengel and myself.[1]

In endeavoring to obtain another series of observations on the distribution and etiology of the hydrothorax of cardiac disease, I have gone over the records of the Presbyterian Hospital in Philadelphia since 1895. In this period of nine years there have been 31 cases of hydrothorax in patients with well-marked disease of the heart muscle and enlargement of that organ. Fortunately, 4 of these cases have been under my personal observation during the past winter in the wards of the Presbyterian Hospital in the service of Dr. John H. Musser, and I had the opportunity of examining two of these postmortem.

The condition required in selecting these cases and in deciding between cases of cardiac effusion and effusion from other causes was that there should be decided evidence of myocardial disease and enlargement of the heart. It was required also that the cardiac condition should be predominant, or at least a very prominent factor in the patient's condition. Aneurism, tumor or any other cause for effusions was sufficient to throw out the case in question.

With one or two exceptions the patients were free from fever, pain and cough. The exceptions were one case of acute pleurisy occurring in a case of well-marked disease of the heart, and two cases of acute endocarditis with great cardiac enlargement and with much effusion.

*Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Practice of Medicine, and approved for publication by the Executive Committee: Drs. J. M. Anders, Frank Jones and W. S. Thayer.

1. Beside Dr. Stengel's paper the following communications concerning pleural effusion of heart disease have appeared in current medical literature since 1897: Gerhardt: Pleural Effusion in heart disease. Rosenbach: Localized Congestions and Effusions in Cardiac Disease, Münchener med. Woch., No. 14, 1901. German; Right-sided Hydrothorax in Cardiac Disease, Gazz. degli Ospedali, No. 99, 1900. Barie: The Involvement of the Pleura in Heart Disease, Semaine Médicale, 1902, No. 4. Esser: Pleural Effusion in Heart Disease, Münchener med. Woch., No. 4, 1902.

As has been said, every case presented distinct signs of degeneration of the myocardium with enlargement of the heart, hypertrophy and dilatation.

Most of the cases had valvular lesions, with or without arterial changes; some had arteriosclerosis and nephritis, and there were two instances of acute endocarditis and cardiac dilatation in children.

In some cases all the chambers of the heart were dilated, in some all the chambers were enlarged, but the right side was mentioned as particularly affected. In others the left side was the only part of the heart enlarged or was the part particularly affected.

In 3 cases one or the other of the pleural sacs was totally obliterated by adhesions, and these have not been included in the tables. As I have said, in one case the effusion is apparently due to acute pleurisy, and occurred entirely on the right side. This gives a total of 27 cases for analysis.

The effusion was at some time during the period of observation confined to the right side in 11 cases, or 40 per cent. The effusion was bilateral, but greater on the right side in 4 cases, or 15 per cent. It was left sided in 5 cases, or 19 per cent., and double, but greater on the left in 6, or 22 per cent. The effusion was double and equal in one case, or 3 per cent.; right sided in 60 per cent., left sided in 40 per cent.

The figures in my first paper based on autopsy findings alone are:

Right-sided hydrothorax, unilateral or greater on the right side, 41 cases, or 77 per cent.; left-sided hydrothorax, unilateral or greater on the left side, 12 cases, or 23 per cent.

Stengel's 17 cases of hydrothorax were practically all right sided, since 2 of the 3 left-sided effusions could be explained by the obliteration of the right sac by adhesions, and the other case was probably due to aneurism. Consequently the figures in the analysis of the Presbyterian Hospital cases are not so conclusive that cardiac hydrothorax in the great majority of cases is right sided as those of Stengel or of my previous article.

The Presbyterian Hospital figures, however, show that the effusion has a decided preference for the right side. The figures indicate very decidedly that the pleural effusions of cardiac origin are usually unilateral or unequal. Moreover, when the etiology of such effusions is considered, it will be seen that the larger percentage of left-sided effusion in the Presbyterian Hospital figures, when taken in connection with the side of the heart affected, is very suggestive and interesting.

The effusion was entirely left sided at some time in 5 cases, or 10 per cent., and was double but greater on the left side in 5 more cases.

That is, the effusion showed a preference for the left side in 10 cases, or 40 per cent. in round numbers, as contrasted with 15 cases, or 60 per cent. that were right sided.

The effusion was double and equal in but one instance, showing very decidedly that these pleural effusions in heart disease are unequal in a great majority of cases.

A very interesting point shown in the table is that, while right-sided effusions occur with enlargement of the right heart, left-sided effusions are usually associated with enlargement of the left heart. This phase of the subject will be considered more in detail in the section on etiology.

It was difficult to ascertain whether the formation of the effusion preceded external edema. Such cases are usually not admitted to the hospital until the severity of the symptoms are such that external edema is present to a considerable degree. It is then usually impossible to fix the time at which the effusion commenced from the history of the patient.

In 3 of my cases edema was absent or slight on admission, while there was considerable effusion; in 3 other cases the edema disappeared before the effusion.

This small number of cases, however, together with the clinical reports in my first paper, and by the observation of Stengel, Gerhardt and others, demonstrate that such effusions may precede external edema.

Various theories have been advanced to explain the formation of this unilateral or unequal pleural effusion in heart disease.

Wintrich, in an article extensively quoted in my first paper, gave obliteration by adhesions of one of the pleural sacs as the most frequent cause for unilateral hydrothorax. He says, however, that the effusions may rarely be one sided, when both pleura are free.

Bucquoy, Saint Phillipe and Dequet insisted that the effusion was inflammatory and attributed it to pulmonary infarction on the right side. Their theory, however, is not supported by the researches of Gerhardt and Stengel, or by either of my lists of cases.

Esser, in a recent paper, reported 3 cases of unilateral right-sided effusion without symptoms in patients with cardiac dilatation, in which autopsies showed large bronchial glands in the root of the right lung. He attributed the effusion to the interference with the lymphatic circulation of the right pleura, which was produced by these glands. This effusion occurred in heart disease, because in such cases the general circulation is feeble, and consequently there is a greater tendency to lymphatic stasis. The improbability of this explanation is obvious. Such a condition was not noted in any of the cases cited by any of the other authorities. Unilateral enlargement of the bronchial lymph glands is not a common enough condition to explain a phenomenon of such regularity as the occurrence of these effusions.

As is shown in Stengel's paper, right-sided effusions in dilatation of the heart are not caused by obstruction to the general lymphatic circulation produced by interference with the circulation of the superior vena cava, and hence with that of the right lymphatic duct. The right lymphatic duct is protected by valves, and if general lymphatic obstruction was the cause of the effusion, unilateral swelling of the arms, neck and chest would necessarily be more frequent.

A group of clinicians, mostly Italians, have observed right-sided hydrothorax in cirrhosis of the liver. Villani reports nine such cases of atrophic cirrhosis, with right-sided pleural effusion in two, of which the diagnosis was confirmed by autopsy. He explained the effusion by assuming that in such cases inflammation of the capsule of the liver extending through the diaphragm caused a low grade of inflammation in the right pleura with effusion without symptoms. He extended this theory to right-sided hydrothorax in cardiac disease. He argued that in such cases of heart disease the liver is distended by passive congestion, and its capsule is subacutely inflamed. This inflammation spreads through the diaphragm in the same manner as he assumed it would in cirrhosis of the liver. Peter and Huchard held approximately the same view.

Piazzi-Martini reported several cases of right unilateral hydrothorax in atrophic cirrhosis, and explained the condition by assuming that the dilated veins of the esophageal plexus pressed on the vena azygos and inter-

fered with the return of blood from the right pleura.

The liver was noted as distinctly enlarged in four of the Presbyterian Hospital cases, and in six of Stengel's seventeen cases. Four of the Presbyterian Hospital and three of Stengel's cases had ascites. All of these cases, however, showed much general edema, so that the abdominal effusion may have been merely part of the general anasarca.

The responsibility of the inflammation of the liver capsule in the cases of right-sided effusion is not obvious, and this theory fails entirely to account for the effusion that is confined to the left side, or greater on that side.

The theory that appears to explain most satisfactorily the preference of these pleural effusions for the right side, supposes that enlargement of the right heart and especially of the right auricle can press on the root of the right lung and obstruct the vena azygos major.

The vena azygos major represents the common trunk of the nine or ten right lower intercostal veins. It lies on the right side of the bodies of the dorsal vertebræ extending from the diaphragm as high as the third intercostal space. From that point it arches forward and curves around the root of the right lung and then empties into the superior vena cava just before that vessel enters the pericardium. It receives as tributary the right superior intercostal vein, which is the common trunk of the three upper intercostal veins. The vena azygos major consequently drains the whole of the costal layer of the pleura from the right side. Obstruction of this vein would, therefore, result in congestion and stasis in the whole of the right pleural sac.

The vena azygos major also receives as tributary the vena azygos minor, which is the common trunk of the lower four or five intercostal veins on the left side. It crosses over the body of the eighth dorsal vertebra to join the vena azygos major. Obstruction of the vena major would consequently cause congestion in the lower third of the left pleural sac.

The vena azygos major, as it curves around and partially surrounds the root of the right lung, is in a position which renders it especially liable to compression. As has been said, such obstruction would produce stasis and congestion in the whole of the right pleura and in the lower portion of the left pleura, and consequently the resulting effusion in its early stage would be wholly right sided, and in its later stage bilateral but greater on the right.

In my former article I advanced the theory that right-sided pleural effusions in heart disease were produced by pressure exerted on the root of the right lung by a dilated right auricle. It has been shown how such pressure would tend to compress the vena azygos major, and hence could cause a passive effusion on the right side, and in case the pressure was long continued would produce a smaller effusion in the left sac.

Dilatation of the right auricle was especially mentioned in sixteen of the thirty-five cases of right unequal hydrothorax tabulated in my first paper. The figures given by the analysis of the Presbyterian Hospital cases strongly support this theory.

In sixteen cases of right unequal hydrothorax in the Presbyterian Hospital list the right side of the heart was much dilated in fourteen. Both sides were dilated in six cases, and the left side alone in two. That is, the right side of the heart was greatly dilated in nine-tenths of the sixteen cases

The two autopsies which I had the opportunity of making personally on two of the cases in the Presbyterian Hospital list, showed much dilatation of the right auricle and ventricle. In both the right auricle pressed on the root of the right lung, and in both the vena azygos major was engorged and dilated. There were no adhesions or enlarged bronchial glands or great congestion of the liver which would suggest any theory for the production of the effusion other than that of pressure on the azygos vein.

The report of these two cases in detail, together with the notes on the autopsies, are as follows:

Case 19.—J. G., male, white, aged 50 years.

Clinical Diagnosis.—Myocarditis, mitral stenosis and insufficiency. Large right-sided pleural effusion which had been tapped once. Specific gravity of fluid 1015, with 4 grams of albumin per liter.

Pathologic Diagnosis.—Double pleural effusion greater on the right side. Mitral stenosis. Thickening of the coronary arteries and myocardial degeneration. Great dilation of the right auricle. The right auricle pressed directly on the root of the right lung. The vena azygos major was dilated and engorged.

History.—The patient had always been a drinking man, but beyond this little concerning his personal or previous history could be obtained. About two years previously he began to suffer from morning vomiting and gradually became short of breath on exertion and lost his usual vigor. He had been under a physician's care for the two months previous for dyspnea and edema of the feet.

Examination.—On admission he had much general edema and some ascites. There were signs of pleural effusion on the right side below the level of the fourth rib. The left side was free. The day after admission 2,000 c.c. of clear fluid was drawn from his right pleura. The specific gravity of the fluid was 1015, and it contained 4 grams of albumin per 1,000 parts, and contained a small amount of blood. After the fluid was withdrawn the left border of the heart was found to extend to the anterior axillary line, the upper border was at the second rib, and the right border was at the right border of the sternum. There was a murmur of mitral insufficiency at the apex preceded by short, rough presystolic murmurs, apparently due to mitral stenosis. There was also a rough systolic murmur in the aortic area transmitted to the carotid. There were no other murmurs. The action of the heart was weak and irregular. The pulse was small and weak, and there was moderate thickening of the radial and temporal arteries. The liver was slightly enlarged, but did not pulsate. There was no pulsation in the veins of the neck.

Course.—The patient was slightly delirious for the next few days. His pulse grew very rapid and irregular and he died suddenly six days after admission.

Autopsy.—Both pleuræ were free from adhesions. There was 1,500 c.c. of clear, slightly blood-stained fluid in the right pleural cavity. The right lung was slightly compressed and somewhat congested, but otherwise normal. There were 200 c.c. of fluid in the left pleura. The left lung was congested.

The left border of the heart extended as far to the left as the anterior axillary line, and the right border, which was formed by the right auricle, extended 4 cm. to the right of the sternum from the third rib to the fifth interspace. All the chambers of the heart were distended. The left ventricle and left auricle were much dilated, and also much hypertrophied. The right ventricle was dilated and hypertrophied. The right auricle was tremendously dilated and as large as a boy's fist. The heart muscle was very pliable and yellow, and evidently much degenerated. The coronary arteries were hard, stiff and calcareous and their caliber was diminished. There was much thickening of the mitral leaflets, and the leaflets themselves were adherent, forming a typical funnel-shaped valve, such as is often seen in mitral stenosis. The aortic valves were thickened and rough, but were competent. The tricuspid orifice was dilated and admitted four fingers, so that there was probably some insufficiency of the tricuspid valves as well. The portion of the heart formed of the right auricle pressed directly on

SUMMARY OF CASES OF PLEURAL EFFUSION IN HEART DISEASE.

Number.	Age in Yrs.	Sex.	Condition of Pleural Sacs.	Pleural Adhesion.	Diagnosis.	Cardiac Enlargement.	External Edema.	Liver.	Remarks.
1	37	M	Effusion commenced on left side. Autopsy: both pleuræ half full.	. . . . .	Autopsy: Mitral stenosis and insufficiency; aortic regurgitation; tricuspid insufficiency.	Both sides enlarged.	Effusion preceded edema.		
2	53	M	Autopsy: Right pleura . . 200 c.c. Left pleura . . Free	. . . . .	Mit'l stenosis and insufficiency.	All chambers enlarged, especially left ventricle; weight 625 grms.	None		
3	56	M	Autopsy: Right pleura . . 270 c.c. Left pleura . . . Free	. . . . .	Mitral insufficiency.	All cavities much distended, especially right auricle (weight 625 grms.			
4	42	M	Right-sided effusion before fourth rib, which increased rapidly; tapped once, 1250 c.c.; left side remained free.	. . . . .	Mitral insufficiency; tricuspid insufficiency.	Enlarged to left and right.	Present. . . .	Enlarged and pulsating.	Clear yellow fluid; pulsation in jugular vein and liver.
5	36	M	On admission: Double effusion; the left effusion disappeared first; confirmed by puncture one week after admission; right-sided effusion to first rib; left side free.	. . . . .	Mit'l stenosis and insufficiency.	Enlarged to left and right	Present on admission.	Enlarged and pulsating.	Fluid clear yellow.
6	52	M	Right-sided effusion to third rib; left side free.	. . . . .	Mitral and tricuspid regurgitation.	Enlarged to left.	Present on admission; ascites.		
7	33	F	Left-sided effusion below fourth rib; right-sided effusion below sixth rib; confirmed by autopsy.	. . . . .	Autopsy: Mitral and tricuspid stenosis and insufficiency.	All cavities dilated, especially right auricle.	Present on admission.	Congested . .	
8	52	F	Clinically and at autopsy, a large double effusion.	. . . . .	Mit'l stenosis and insufficiency; tricuspid insufficiency.	Bulk of heart made up of greatly dilated auricles; the right auricle was especially dilated.	Present on admission.	Congested . .	
9	52	M	Lower half of right pleura contained one quart of fluid at autopsy.	Both sides obliterated, except lower half of right pleura.	Arteriosclerosis; fatty heart.	Both sides enlarged and dilated.	. . . . .	. . . . .	Pulsation in jugular vein.
10	43	F	Autopsy: Lower half of right pleural sac contained 8 ozs. of fluid.	Both sides obliterated, except lower part of right pleura.	Fatty heart. . . .	All chambers dilated, especially right side.	. . . . .		
11	68	M	Clinically; Right-sided effusion; left free. Confirmed by autopsy.	None	Autopsy: Fatty heart; atheroma; mitral stenosis; aortic thickening.	All chambers enlarged, especially the right and left auricles; weight 650 grms.	Present.		
12	60	F	On admission: Left side, effusion up to third rib; right side, effusion to fifth rib, three weeks later; double effusion; tapped once. Soon after patient developed fever with development of pus in left pleura and 1000 c.c. pus was removed.	. . . . .	Mitral insufficiency and stenosis; action weak and irregular	Enlarged to left and upward in left.			
13	74	F	Clinically on admission: Acute pleurisy on right side with effusion up to the fourth rib; no effusion in left side. The effusion persisted for some days after subsidence of fever and then disappeared.	. . . . .	Mitral insufficiency; aortic insufficiency and roughening; fatty heart.	Enlarged to left.	. . . . .	. . . . .	Fever on admission which lasted for six days, with pain on right and cough; fever gradually disappeared.
14	41	F	Clinically on admission: Right-sided effusion up to angle of scapula; confirmed by autopsy.	Autopsy: Left side totally obliterated by adhesion.	Autopsy: Mitral stenosis and insufficiency; fatty heart; arterial sclerosis.	Clinically: enlarged, especially toward right.	Present on admission.	. . . . .	History of acute articular rheumatism; 3 weeks of sharp pain in chest; leucocytes 28,000.
15	45	M	Clinically on admission: Double effusion slightly greater on right, which gradually disappeared.	. . . . .	Mitral stenosis and insufficiency; aortic insufficiency.	Enlarged to left and right; left border, anterior axillary line; right border, right parasternal line.	Present on admission; ascites, which gradually disappeared as improvement occurred. . .	. . . . .	Considerably jaundiced; gradually improved until an attack of cerebral apoplexy caused death.
16	52	M	On admission: Right-sided effusion to third rib; confirmed by puncture; later some left-sided effusion.	. . . . .	Aortic roughening and regurgitation.	Clinically; enlarged to right (right parasternal line) and to the left.	Slight on admission.	Enlarged to within 1 inch of umbilicus.	Recovered slowly and effusion disappeared.
17	40	F	Clinically: Double effusion greater on left; confirmed by puncture. Tapped left twice 510c.c. Tap'd right once 800c.c.	. . . . .	Clinically and at autopsy: Mitral stenosis and insufficiency; tricuspid insufficiency; fatty heart; atheroma of coronary arteries.	Autopsy: Dilation of all chambers, but especially of the right auricle; weight 600 grms.	Present on admission; ascites.	. . . . .	Fluid 1020; albumin, 45 per 1000. Patient had been in hospital several times for same trouble; gradually grew worse and died; autopsy reported in full in paper.
18	..	M	Admitted twice with pleural effusion. Always on right; left side remained free; right side tapped once 1240 c.c. and filled again rapidly and then disappeared as patient recovered, but persisted longer than external edema.	. . . . .	Mitral insufficiency; aortic insufficiency; degeneration of myocardium.	Enlarged to left and right.	Present on each admission; ascites; edema disappeared before the effusion.	. . . . .	Had been admitted 4 times for cardiac disease; twice with pleural effusion; fluid 1014; albumin 1.5 per cent. by weight; death; no autopsy.

SUMMARY OF CASES OF PLEURAL EFFUSION IN HEART DISEASE.—CONCLUDED.

Number.	Age in Yrs.	Sex.	Condition of Pleural Sacs.	Pleural Adhesion.	Diagnosis.	Cardiac Enlargement.	External Edema.	Liver.	Remarks.
19	50	M	Clinically on admission: Right-sided effusion up to fourth rib; left side free; right side tapped, 2000 c.c. Autopsy: Right side, 1500 c.c.; left side, 300 c. c.	. . . . .	Autopsy: Fatty heart; atheroma of coronaries; mitral insufficiency, (relative?)	Clinically: Left side enormously dilated, left anterior axillary line; right border, right edge; Autopsy: All chambers distended; right auricle enormously dilated.	Present on admission; ascites.	Congested and enlarged.	Fluid 1015; albumin 4 per 1000; autopsy reported elsewhere.
20	53	M	Autopsy: Left pleura. . . 1300 c.c. Right plura. . . 750 c.c.	. . . . .	Autopsy: Acute pericarditis; chronic interstitial nephritis; arteriosclerosis; no valve lesions.	Autopsy: Enormous involvment of left ventricle.	Considerable edema; some ascites.		
21	44	M	Left-sided effusion 750 c.c. at autopsy	Some on left side.	Chronic parenchymatous nephritis; no valvular lesions; fatty heart.	Much enlargement of left ventricle.	Present; legs and eyes.	Much congested.	
22	60	M	Left-sided effusion. . . .	Some in right side.	Aortic thickening; fatty heart.	Dilated hypertrophy of left ventricle.	Both legs		
23	31	F	Autopsy: Left pleura ¾ full; right pleura almost empty.	None	Chronic interstitial nephritis; no valvular lesions.	Hypertrophy of left ventricle; heart weighed 535 grms.	Legs and eyes; preceded pleuralefffusion; ascites.	Atrophic; wgt. 1420 grms.	
24	47	F	Double effusion greater upon the left.	None	Chronic interstitial nephritis; no valvular lesion.	Much hypertrophy of left ventricle; weight 740 grms.	Legs and face; preceded pleural effusion; some ascites.	Congested and enlarged.	
25	29	M	Autopsy: Right sac contained 1000 c.c.	Left sac obliterated.	Mitral stenosis and insufficiency; general athcroma.	All cavities enlarged, especially left venticle.	Present on admission.		
26	58	F	Autopsy: Right pleura contained 400 c. c.; left pleura contained 200 c.c.	. . . . .	Mitral, tricuspid and aortic valves all thickened; fatty heart.	All chambers enlarged.			
27	58	F	Autopsy: Double effusion, greater on right.	. . . . .	Mitral stenosis and insufficiency.	Much enlarged, especially right auricle and ventricle which were greatly dilated; weight 600 grms.	Present		
28	50	F	Autopsy: Left pleura completely filled; right pleura one-half full.	. . . . .	Double aortic disease.	Right side enormously dilated; left ventricle enlarged and made up bulk of heart.	Legs; some ascites.		
29	33	M	Right effusion to 2nd rib, which slowly increased; left remained free.	. . . . .	Aortic roughening and insufficiency; mitral insufficiency.	All chambers enlarged.	Present on admission.		
30	8	F	Double effusion, decidedly greater on right; confirmed by puncture; right to 5th dorsal vertebra; left to 8th dorsal vertebra.	. . . . .	Acute endocarditis of mitral and aortic valves; old mitral insufficiency and stenosis; presystolic thrill at apex	Enlarged upward to 2nd rib and to right to right parasternal line; enlarged slightly to left; probable dilation of left auricle and right side of heart.	Slight of legs; disappeared before effusion	. . . . .	History of rheumatism and chorea; improved and effusion disappeared; the patient had an irregular fever for the first 2 weeks after admission.
31	12	M	Left-sided effusion up to angle of scapula; disappearing as heart grew stronger and reappearing with relapse of endocarditis.	. . . . .	Acute endocarditis, myocarditis and pericarditis; mitral insufficiency; tricuspid insufficiency; friction rales in pericardium on first admission.	Enormous dilation of left ventricle and left auricle; less degree of dilation in left side.	Present on both admissions, disappearing rapidly.	. . . . .	Sudden onset of acute endocarditis with fever first week; leucocytosis; gradual improvement and discharge; returned in 8 days with fever and return of all symptoms; systolic pulsation in veins of neck.

the root of the right lung and must have exerted some pressure on it.

The course of the vena azygos major could not be traced around the root of the lung since all the tissues were very edematous, but the vein was dissected out as it ran up along the spine underneath the costal pleura. It was distended by dark blood and was fully one-third of an inch in diameter. The lower intercostal veins were correspondingly dilated. The left azygos, or azygos minor, was small and collapsed, and could not easily be found. The surface of the pleura showed nothing out of the ordinary.

There was some ascites. The liver was rough and hard, and there was a high grade of the cyanotic induration. There was no perihepatitis. The kidneys also showed cyanotic induration and were much congested. There was no enlargement of the esophageal veins.

CASE 17.—A. B., female, colored, aged 40 years. The patient had been admitted twice in six months for the same condition.

Clinical Diagnosis.—Much pleural effusion, greater on the left side. Myocardial degeneration and mitral disease. Tapped twice. Specific gravity of the fluid was 1020, and it contained 4.5 grams of albumin per liter.

Pathologic Diagnosis.—Double pleural effusion, greater on the left. Fatty heart. Great dilatation of all the chambers of the heart, equally as great on the left as on the right side. The vena azygos major was dilated and engorged.

History.—She had had several attacks of acute articular rheumatism. In December, 1902, she began to suffer from dyspnea, vertigo, cough and fainting attacks. In June, 1903, her feet began to swell for the first time. She was admitted to the hospital July 27.

Examination.—On admission she had much dyspnea and could not lie flat in bed. There was no fever or cough. Examination of her lungs showed evidence of effusion in both pleural sacs, but more on the left than on the right side. The heart was enlarged to the left and to the right, the apex was in the sixth interspace one inch outside the mid-clavicular line. There were blowing systolic murmurs at the apex and in the aortic area. The urine was of good specific gravity, averaging 1020. At first it contained albumin, but this disappeared as the patient improved.

Course.—She grew rapidly better under digitalis, strychnin, nitroglycerin and rest in bed and was discharged in a few weeks. At the time of her first discharge there was no evidence of fluid in her pleural cavity. The patient remained fairly well until Nov. 12, 1903, when she was again admitted with symptoms of failing compensation.

Examination.—At that time her condition was as follows:

Thorax: Evidence of effusion in both pleural sacs, greater on the left side. The effusion extended to the level of the fifth rib on the left, and on the right to the level of the seventh rib. Exploratory puncture gave clear yellow fluid on both sides. This fluid had specific gravity of 1020 and contained 4.5 per 1,000 albumin. Respiratory murmur above the effusion was clear with the exception of a few râles.

Heart: The heart was enlarged to the left, to the right and upward. There was a systolic murmur at the apex, which was also heard in the aortic area, but was not transmitted to the vessels of the neck. There was a distinct systolic murmur in the tricuspid area of a different character than that heard at the apex. This murmur apparently originated at the tricuspid valve. There was systolic pulsation in the veins of the neck.

Liver: The liver was somewhat enlarged but did not pulsate. There was some edema of the legs and ascites.

November 14, 600 c.cm. of clear yellow fluid was drawn from the left pleura and November 17, 450 c.cm. were drawn from the left side. November 18, the right chest was tapped and 800 c.cm. of clear yellow fluid was obtained.

Blood: Red cells 72 per cent., hemoglobin 68 per cent., white cells 6,000. There was slight cough and no fever. The urine was scanty and albuminous and contained casts. The patient died suddenly December 3.

Autopsy.—The right pleural cavity showed some firm adhesions posteriorly, probably diminishing the capacity of the right pleural cavity to a considerable extent. The right pleural cavity contained 130 c.cm. of clear fluid, the left pleural cavity was free and contained 400 c.cm. of clear fluid. The layers of the pleura on both sides were thickened, but not congested. The vena azygos major could be plainly seen lying against the spinal column on the right side. It was considerably dilated and was approximately the size of a large goosequill. The vena azygos minor was not dilated and was collapsed so that it could not be satisfactorily studied. There was dilatation of the right and left auricle, about equal in degree. The right auricle extended two inches to the right of the sternum in the fourth interspace. There was dilatation and hypertrophy of the left ventricle and dilatation of the right ventricle. The mitral valves were insufficient, due to the thickening of the valve leaflets and chordæ. The tricuspid valves were insufficient, due to a dilatation of the valve orifice. There was atheroma of the aortic valves and the aorta, and great thickening and calcareous infiltration of the coronary arteries. The lumen of these vessels was considerably diminished. The wall of the left ventricle near the apex was very thin. The section of the heart muscles in these areas showed much degeneration. There was hypostatic congestion of both lungs. There was moderate fatty degeneration and fibroid changes in both kidneys. The kidneys each weighed 160 grams. The heart weighed 600 grams.

In my first paper I reported the result of the autopsy on a case of double hydrothorax greater on the right side, increasing as the heart lost strength. There was little ascites and edema, but the thoracic effusion preceded the appearance of the subcutaneous edema.

Autopsy showed chronic fibrous myocarditis and hypertrophy and dilatation of the heart, especially affecting the right auricle. The dilated right auricle pressed directly on the root of the right lung.

The right pleural sac contained 1,600 c.c. of clear blood-stained fluid. The visceral layer of the pleura was somewhat thickened, but there was no sign of acute inflammation. The left pleural sac contained 600 c.c. of clear blood-stained fluid.

The liver was slightly smaller than normal, and there were a few adhesions between it and the diaphragm, which were evidently due to an old perihepatitis, but there was no evidence of any recent inflammatory process. The bronchial glands were not enlarged nor diseased.

Wintrich has reported a case of unilateral right-sided hydrothorax without external edema. Wintrich remarked that no cause could be found for the effusion except a dilated right auricle, the result of chronic myocarditis from alcoholism. There was no inflammatory change about the liver, nor ascites.

Stengel reports two autopsies in his list, in which there was dilatation of the right ventricles, auricles and venæ cavæ, and marked backward pressure on the root of the right lung and azygos vein. One of these was a case of unilateral right-sided hydrothorax, and the other was one of double hydrothorax greater on the right side.

Dr. Stengel states as his opinion that such pressure on the root of the right lung, causing compression of the vena azygos major, is the cause of the right-sided effusions observed in his cases. In his article he gives a very convincing anatomic diagram prepared by Dr. G. G. Davis, which shows very plainly how dilatation of the right side of the heart may press on the root of the right lung, and compress the vena azygos major.

Dr. Stengel and myself can not claim the entire credit of originating this explanation for such right-sided effusions. Baccelli advanced this theory in a modified form as early as 1863. He assumed that a dilated right heart produced obstruction of the vena azygos major not by direct pressure on the root of the lung, but by a downward displacement of the right side of the heart due to its increased size and gravity. The superior vena cava would then be carried downward and with it the azygos major, consequently this vein from its anatomic position would be drawn tightly around the root of the lung and compressed. Baccelli's idea was supported by Lizzato, Cardinelli and Fusa.

Rosenbach has advanced the theory that such right-sided effusions are explained by the pressure exerted on the azygos vein by dilatation of the right heart. This is aided by congestion of the liver caused by weakness of the heart. The enlargement of the liver hinders the action of the diaphragm, and consequently prevents thorough emptying of the veins of the right side of the pleura, thus favoring an effusion.

Just as the dilatation of the right heart appears to bear some relation to right-sided pleural effusion, so enlargement of the left heart, with or without involvement of the right side, was observed in nearly all the cases of left-sided effusion. In the eleven cases of effusion confined to the left pleura, or greater on that side, the left heart, and especially the left ventricle, was especially mentioned as enlarged in nine cases, that is, in four-fifths of the cases of left-sided effusion. It seems fairly well established that dilatation of the right heart bears some relation to right-sided effusion. The figures just given suggest also that enlargement of the left heart may bear some relation to left-sided effusion. I can give no reason why this should be so. The pressure of a dilated left auricle on the root of the left lung would not obstruct any large venous trunk analogous to the vena azygos major. The venous drainage of the upper part of the left pleura is afforded by two small veins, the upper left azygos vein and the left superior intercostal vein. These are so placed that they are not liable to compression by an enlarged left heart.

Rosenbach explains these left-sided effusions by assuming that the enlarged left ventricle presses on the lower lobe of the left lung and produces atelectasis. Long-continued congestion produced by the collapse of the lung brings about a low-grade inflammation of the pleura, and finally an effusion forms in the pleural sac which is partly transudate and partly inflammatory.

My list of cases gives nothing to confirm or to deny this theory of Rosenbach. I can only call attention to the fact that left-sided cardiac dilatation seems to bear some relation to left-sided pleural effusion.

Signs of acute inflammation of the pleura were not found at autopsy in any of the Presbyterian Hospital cases, or in any of those analyzed in my former paper. Dr. Stengel did not find any such condition in the three autopsies held on the cases he reports. However, the fluid removed in Cases 1, 2 and 3 had too high a specific gravity and too large an amount of albumin for a pure transudate. The fluid did not contain fibrin and was certainly not the result of an acute inflammatory process, but the physical characteristics of this fluid are such that it might have been the result of transudation combined with an exudate of a low-grade inflammation of the pleura, as has been suggested by Rosenbach.

The pleura in Case 17 and in Case 4 of my previous paper were reported as thickened and whitened, although there were no signs of acute inflammation. It may well be that long-continued congestion had set up some subacute inflammation here, which was not active enough to cause fever, cough or pain, but may have aided materially in the production of the effusion.

Stengel suggests that a long-continued congestion produces some trophic change in the vessels of the pleura favoring the passage of the fluid, and also calls attention to the fact that inflammation of the pleura may be latent and without symptoms. He suggests that in some cases an inflammatory element may be present in the production of these cardiac pleural effusions.

Gerhardt mentions a class of cases in which the effusion is very obstinate and recurs with great rapidity and persistence. Some of these cases have been tapped a great number of times, and the clinical picture they present is that of a chronic pleuritis of a low grade, combined with a process of transudation, due to the congestion of the vessels of the pleura.

Certain features of two of my cases suggest that some trophic change takes place in the pleura in cardiac disease that may render the pleura membrane a point of lessened resistance to infection.

Case 13 was an instance of acute pleurisy which occurred on the right side in a case of well-marked heart disease, with cardiac dilatation and symptoms of failing compensation. The pleurisy was accompanied by pain and fever.

In Case 12 the empyema developed in a case of double cardiac hydrothorax, greater on the left side, after both pleural sacs had been emptied by aspiration. The heart was much enlarged toward the left.

These two cases suggest that long-continued congestion may have altered the tissues of the pleura and that the pleural sac had become a locus minoris resistentiæ. Two isolated cases of this sort are not very convincing, but they are mentioned because they seemed to have some bearing on the question as to whether the effusion in cardiac disease is purely a transudate, or whether it is partly passive and partly inflammatory.

It seems probable, then, that the mechanism of the formation of fluid in these cases of pleural effusion in heart disease is not that of a simple transudate, but that congestion of the pleura produces a chronic inflammation of low grade, and that the effusion is both a transudate and an exudate. This is supported by the following facts: First, the specific gravity of the fluid and the amount of albumin contained in it is often too high to be consistent with the pure transudate; second, the effusion may precede, by a considerable length of time, external edema or other serous effusions; third, the two cases reported suggest that the pleural sac particularly affected may undergo some trophic change, making it a point of lesser resistance to infection; fourth, the effusion in certain cases is very obstinate, lasts a long time and returns quickly after aspiration.

Gerhardt mentions the obstinacy and persistence of this effusion as a characteristic of this class of cases. Rosenbach, Brouardel and Liebermeister have called attention to this peculiarity of such pleural effusions.

Rosenbach mentions two cases in which the effusion lasted six and fourteen months respectively.

None of my cases showed this obstinacy of the effusion in any marked degree. Several of the patients were admitted to the hospital more than once for symptoms of failing compensation and pleural effusion, but usually one or two tappings were sufficient to relieve the dyspnea, and the fluid returned slowly, even when the case was near to a fatal termination.

There was no case in the Presbyterian Hospital list in which the fluid persisted for any great length of time, and which was not relieved by one or, at most, two tappings. The effusion usually disappeared spontaneously as the patient grew stronger, or else increased slowly until death. Consequently, I can not say that the Presbyterian Hospital list supports the statement of Gerhardt and Rosenbach, that great obstinacy is a characteristic of these pleural effusions in heart disease.

PROLONGED DELIRIUM IN PERICARDITIS AND ENDOCARDITIS.

WITH REPORT OF A CASE.*

EDGAR MOORE GREEN, A.M., M.D.

EASTON, PA.

I have taken the liberty of bringing to your notice the subject of delirium in certain diseases of the heart, not because it was possible for me to demonstrate any new scientific theory, but rather because from my reading and my own limited personal experience it seemed to me that prolonged delirium in such cases was quite unusual. It is, of course, well known that heart disease is a frequent complication of rheumatism, and endocarditis is much more common in such cases than is pericarditis. According to Whittaker,[1] Bouillaud believed that in every case of acute articular rheumatism the heart was more or less affected. Williams states that 75 are affected in every 100 cases. Leudet fixes the ratio at 22 in 100; Sibson 20 in 100, Wünderlich 19 in 100, Duchek 16 in 100. Bamberger has claimed that 30 per cent. of cases of cardiac trouble arise from rheumatism, and Thompson has placed the figures at 16 and 20 per cent. On the other hand, Latham states that pericarditis only occurs seven times in 136 cases of rheumatism. The latter disease is certainly more apt to occur in severe cases, and is said to be more frequent when the inflammation has a tendency to wander from one joint to another in rapid succession. It is said to occur very infrequently in cases of subacute or chronic rheumatism; in fact, some authorities deny that it ever occurs as a complication of the latter.

Ordinary cases of the disease run a comparatively

*Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Practice of Medicine, and approved for publication by the Executive Committee: Drs. J. M. Anders, Frank Jones and W. S. Thayer.

1. Twentieth Century Practice.

short course, frequently not more than eight or ten days, except where the amount of effusion is great, and these terminate in from three to six weeks. It will not be necessary for me to enumerate the ordinary symptoms and complications of this disease. I may say, however, that the rarer symptoms mentioned by most authorities are aphonia and hoarseness, from pressure on the left recurrent or laryngeal nerve, syncope from anemia of the brain resulting from pressure on the large vessels of the heart or myocarditis, vomiting from pressure on the phrenic nerve. Stupor, delirium and coma are mentioned as occurring from hyperemia due to pressure on the vena cava or to the accumulation of toxins in the blood. All authorities whom I have consulted, however, have stated that the latter signs usually show themselves in the last stages of the disease. Austin Flint has reported cases marked by delirium, but in all the cases of which I have read the delirium has been of comparatively short duration.

It will not be necessary for me to give a detailed report of the symptoms of this case, but a résumé may be given as follows:

History.—Dec. 15, 1902, I was called to visit a man, age 46, whom I found to be suffering from acute rheumatism. His previous health had been good. Early in life he was said to have had an attack of brain fever, but of this I could obtain no detailed history. He had had two attacks of acute rheumatism, each lasting several weeks. In one of these attacks he had been under my care, and, although the case was somewhat tedious, there were no complications and he made an uninterrupted recovery. There was no specific history. During the first week of his illness the inflammation was rather migratory in character, at one time an arm would be affected, on another day one knee would be inflamed, or one ankle or possibly both ankles, at another time an elbow or wrist. During this time the temperature ran as high as 103 to 104 degrees. At the end of about one week he was suddenly taken with pain in the left side about the level of the fifth and sixth ribs. This pain was acute in character and accompanied each inspiration, the respiration became more rapid, running up to 37 or 38 per minute, pulse 100 to 108, temperature 100 to 101 degrees.

Examination.—Auscultation at this time revealed symptoms of acute pleurisy, and also a systolic murmur over the precordium, but more intense at the apex. There was also found a to-and-fro friction sound at the fourth and fifth interspaces directly over the heart. The sounds of the heart rapidly diminished in force and loudness. Visible impulse of the heart was practically obliterated. Percussion of the chest revealed great increase in the lateral diameter of the cardiac dullness. The urine was about normal in quantity, but was quite high colored and of high specific gravity. There was no albumin nor sugar, but urates were present in considerable excess.

Symptoms.—In addition to great pain in the region of the heart there was difficulty in swallowing. The latter symptom was so marked that even the swallowing of liquids caused great discomfort and frequently he was unable to take more than one or two swallows in succession. At the same time he became extremely restless, talkative and frequently saw imaginary objects. It was exceedingly difficult to induce sleep. Morphin, ¼ gr., with atropin would partially relieve pain, but seldom caused more than one hour's continuous sleep. He was exceedingly restless, frequently trying to get out of bed and almost constantly trying to pick up imaginary objects. His most frequent delusion was that he was traveling in some distant city or foreign country, although he usually recognized those about him. After a number of days he believed he was on a sort of houseboat on a trip which his wife was conducting. His usual question when I visited him in the morning would be, "Well, how did you get here today?" It is difficult to understand how this delusion could have originated. His occupation for several years had been that of superintendent at large iron works and during certain seasons of the year he was in the habit of traveling for the making of purchases in various parts of the West. At no time did his delirium become violent, though, as stated before, he frequently attempted to get out of bed. This mental condition continued without interruption until January 26, or about five weeks, when, after a fair night's sleep, the nurse stated that his mind wandered but little. After this time the mind was more or less confused for a few moments at a time each day for two weeks, but it may be said that the mental condition steadily improved. From the time of the onset of pericarditis his temperature did not run above 100.4 degrees. As a rule, it would fall to 99 or even 98.6 degrees in the morning and would rise to 100.2 degrees in the evening.

Dyspnea was always present, though it did not develop to the extent of orthopnea. Cyanosis was also present and its presence, of course, indicated the extent to which the brain must have been disturbed by this venous congestion. Osler states in his practice that delirium and marked cerebral symptoms are associated with the hyperpyrexia of rheumatic cases. I think, however, that you will agree with me that the degree of fever was not sufficient in this case to account for the continuance of delirium through so long a period of time.

Treatment.—December 31, Dr. William L. Estes of South Bethlehem was called to see the case in consultation. The treatment adopted at this time was large doses of citrate of lithium and potassium with iodid of potassium three times a day. Tincture of strophanthus was also given three times a day in doses of ten drops. Fortunately for the patient the bowels were rather active, frequently four to five stools per day, and these were often more or less watery in character. Under the action of the alkaline salts given with copious draughts of water, the kidneys became more active, the quantity of urine running some days as high as 102 ounces and not on any day being allowed to fall below normal. The skin was kept active and perspiration continued profuse. As soon as the patient's condition permitted general massage was given in order to tone up the general system.

Result.—Recovery, of course, was very slow, and he was not allowed to take up any work until March 31; even then the amount of physical exercise was much restricted. In October, however, he started West on a business trip and much of his time was spent at great elevations above the sea level and yet with no untoward result. On November 8 he left Durango, Colorado (elevation 6,520 feet), at 8 a. m. and went to Silverton (elevation 9,224 feet), where he walked two miles to a stamping mill and there climbed up to a height of 150 or 200 feet, afterward returning by train to Eureka. The following day he drove twenty-six miles alone, starting from Silverton (elevation 9,224 feet), and going to Ouray (7,700 feet), passing meanwhile over a height of 11,002 feet, then on nine miles further to Mount Snefles (elevation between 11,000 and 12,000 feet), and back to Ouray at 6 p. m.

The ability to take such an amount of exercise at such an elevation would seem to me to show how thorough his recovery had been; moreover, careful physical examination of the chest made within the last few days revealed no markedly unnatural sounds. The cardiac impulse is normal in location and force, and the sounds almost natural in character, except for a slight blowing murmur heard at the apex.

How They Do It in Iowa.—A Red Oak paper of August 20 has the following: "Dr. A. A. Potter, who advertised that he would be in Red Oak last Saturday and meet all who wished to have their ills taken away and their youth renewed, was on time all right. But he met with grief a plenty. He had no more than unpacked his pill box when a local officer arrested him and took him before Mayor Reiley to answer to the charge of practicing medicine in Red Oak without having procured a license. The doctor plead guilty and was fined $29.10. He left town."—*Iowa Health Bulletin.*

THE LIMITATION OF DIGITALIS IN MITRAL AND AORTIC REGURGITATION.*

FRANK JONES, M.D.
MEMPHIS, TENN.

While this subject has been thrashed over and ground up before various medical societies and by numerous eminent authorities, there yet remains much to be done in the crystallizing and refining process. What I have to say may seem erratic and dogmatic to some, but I shall try to show by reason of the anatomic location and the physiologic action of the mitral and aortic valves, that in mitral insufficiency when compensation has failed or is failing digitalis is the sheet anchor, the general in command, while in aortic insufficiency with the same condition, it too often plays the rôle like the soldier, Jack Falstaff, of old.

In treating any heart lesion the careful clinician must study closely the cardiac state and the condition of the blood vessels, and he must take into consideration the various organs that are complicated.

The mitral valve, located as it is, at the gateway between the great arterial reservoir, the left auricle and the great arterial pumping station, the left ventricle, can, when it fails to close with systole, throw its burdens on various organs, particularly the right heart, the lungs, liver and kidneys. When compensation has failed or is failing the pathologic picture is that of venous stasis.

The column of blood is forced back on the left auricle. This chamber of the heart can not perform its functions as a reservoir, receiving the blood from the pulmonary veins and sustain this backward flow at the same time. As a result the pulmonary veins are obstructed in their efforts in carrying the systemic blood to the auricle. The right ventricle has to contract against resistance. It has to pump the venous blood of the right side through the lung already engorged from the backward pressure through the pulmonary veins, hence the marked hypertrophy of the right ventricle which ensues. The lungs are overwhelmed, this condition giving rise to dyspnea as an evidence of edema, and to cough denoting bronchitis from irritation to the terminal branches of the bronchial tree. This edema and bronchitis will be in proportion to the degree of obstruction and stasis, and the condition of the cardiac muscle.

This backward pressure exerts its force further on the liver, giving rise to marked engorgement of this organ through the inferior vena cava; on the stomach, spleen and intestinal tract through the portal vein; on the kidneys through the renal veins. Thus it can be seen that we have hyperemia of the lungs, liver, stomach, bowels and kidneys. We have stasis everywhere, beginning at the incompetent valve and ending in a great many cases in the rectum, in the form of hemorrhoids. It is seldom that one sees a classical mitral regurgitation with failing compensation but what hemorrhoids are also found. All these organs enumerated have important functions to perform. Nutrition is profoundly disturbed as a result of this stasis and engorgement. The governing band of metabolism has run off. The constructive and the destructive forces are in a state of unstable equilibrium. We have perverted secretions, faulty excretions, bad nutrition, low blood pressure, vitiated blood and leaking blood vessels. Dropsy, in mitral insufficiency, if properly treated, very often yields readily.

With this clinical picture before you, with all the organs stagnated and overflowed, is there any necessity for dwelling on the marked effects of digitalis in mitral insufficiency with failing compensation? The very location of the mitral valve when the muscle becomes incompetent is conducive to marked hyperemia and venous stasis. The right heart, in other words, must suffer the brunt of nearly all the evils as a consequence of failing compensation. Now let us consider the other great valvular lesion, aortic insufficiency. The aortic valve stands as a sentinel at the very gateway of life, the aorta. This great blood vessel arises from the great pumping station, the left ventricle. When this valve becomes incompetent from disease, and when the left ventricle fails to compensate and cries for help, it has not the neighbors to call on as the mitral valve has. When it does sound the alarm and cries for help it is, alas, too often too late. When the aortic valve becomes incompetent and can not close with diastole, we have a backward column of blood from the aorta thrown on an organ highly endowed with muscular structure, the left ventricle. For a long period of time the left ventricle is the only portion of the heart that comes to the rescue of the incompetent valve when it cries for help. The ventricle responds with vim and vigor. It puts forth all of its energies. Its fight and struggle is something to be applauded. In its efforts to relieve the leaking valve it becomes enormously hypertrophied. The beef heart attains to its most classic and highest degree in aortic regurgitation. In nearly all cases of aortic incompetency there is naturally a high blood tension.

There frequently exists a well-defined arteriosclerosis. There is not the hyperemia of all the organs which we find in mitral insufficiency, except in the terminal stage when death is close at hand. With this evidence before you let me ask, Has digitalis any place in aortic insufficiency? Nearly all of the eminent authorities teach us that when the left ventricle fails in its efforts to come to the rescue of the incompetent aortic valve, and becomes dilated and relaxed to such a degree as to produce leakage at the mitral valve, then digitalis is indicated.

The argument is that this secondary or relative, or more properly speaking, muscular insufficiency on the part of the mitral valve gives the mitral symptoms of engorgement and stasis added to the aortic symptoms. Therefore, digitalis must be given, just as we would in a frank case of mitral insufficiency with failing compensation. In other words, they teach that failing compensation, it matters not from what source, means digitalis as a remedial agent. I wish to oppose these views most emphatically. Digitalis in my hands has no place at all in aortic insufficiency, it matters not what may be the condition of the muscular structure of the heart. The conclusions reached have not been on theoretical grounds, as some of our authorities are so accustomed to charge, but from a careful clinical bedside study in the hospital wards and in the outdoor clinic.

As we said in the outset, in mitral insufficiency with failing compensation it is the general in command. It tones up the walls of the blood vessels by its vaso constrictor action. It comes to the aid of the left ventricle, which does not primarily undergo that marked hypertrophy which we have in aortic insufficiency. By its actions on the ventricles, particularly the right, and the walls of the blood vessels, engorgement is relieved, blood tension is raised, stasis is overcome, absorption of serum through the blood vessels and lymphatics takes place,

*Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Practice of Medicine, and approved for publication by the Executive Committee: Drs. J. M. Anders, Frank Jones and W. S. Thayer.

very often symptoms disappear and the patient is made fairly comfortable.

As Broadbent well says in his book on diseases of the heart: "Mitral insufficiency with dropsy is the disease that brings patients to the outdoor clinic. Dropsy can be relieved, their symptoms can be materially alleviated so that they can resume for a time their occupation."

My experience at the outdoor clinic voices the sentiment so well expressed by Broadbent. Dropsy, however, in aortic insufficiency means preparation for a funeral in a short while.

It can readily be seen why this is so. The ventricles, particularly the left, become hypertrophied and dilated, relaxed, worn out and degenerated to such a degree that the administration of digitalis is of no use.

To give digitalis in aortic insufficiency, where we have secondary mitral leakage from ventricular dilatation, calls to mind the fable of the crawfish and the worm. They became engaged in a heated argument. Harsh words followed. They challenged each other to a duel. When they met on the field of battle the worm entered a protest that the crawfish had all advantage of him because he (the worm) could not tell which end of the crawfish to attack, because, as you know, the crawfish can move as freely backward as forward.

So it is in giving digitalis in aortic insufficiency with failing compensation. You do not know which end of the circulation the digitalis is going to attack. In aortic insufficiency with failing compensation, where the mitral valve is relatively incompetent, we have leakage both at the mitral and aortic openings. The leakage at the mitral valve spins its force backward with systole on the pulmonary veins, lungs and the right heart. The backward current from the aorta through the incompetent aortic valve spends its force on the left ventricle.

Let me ask the authorities who contend that digitalis is as much indicated in aortic insufficiency with failing compensation as in mitral insufficiency: Does not the digitalis by its action drive as much blood back through the incompetent mitral valve as it does forward through the incompetent aortic valve? Does it not in this way increase the already existing stasis in the left auricle, pulmonary veins, lungs, right heart and liver? The authorities will answer by saying that digitalis will contract the ventricle, and by so doing will close the mitral valve, thus checking this backward flow, thereby relieving stasis.

Let me ask: When you close the mitral valve do you not put too much work on the left ventricle already overburdened from its continued efforts to come to the rescue of the incompetent aortic valve? Is there not danger by increasing this pressure within the ventricle of paralyzing the left ventricle already dilated to its utmost degree? Do you not put too much work on it while the coronary arteries are crying out for blood to maintain nutrition in the muscle? You are giving the heart more work to do and a stone for food, while it is crying out for rest and bread.

Dropsical symptoms in aortic insufficiency are very late manifestations. They are the expressions of a heart tired and fagged in its efforts to relieve the incompetent valve, and in the majority of cases the dropsical manifestations have their origin in the mitral and not in the aortic valve. To give digitalis in these cases is like trying to make a wick burn when there is no oil in the lamp, or like trying to make an engine pull a heavy train up grade with the brakes on, with the flues burnt out and no steam in the boiler. When compensation fails in aortic insufficiency the left ventricle goes to pieces very much after the fashion of Dr. Holmes' masterpiece, "The Deacon's One Horse Shay."

Let me quote from our own Dr. Babcock, in his most excellent book on diseases of the heart. You may read between the lines just which way the pendulum is swinging in his analytical mind. He says: "In cases, therefore, of aortic defects manifesting dropsy, the indication is for the administration of cathartics and digitalis the same as in mitral disorders. I believe, however, that the latter should be administered with judgment. There are some physicians who advocate the employment of large doses of digitalis in all cases of aortic regurgitation with broken compensation. My experience leads me to agree with Broadbent when he says that a distinction should be made between cases of aortic insufficiency with edema and those without. When loss of compensation is shown by symptoms pointing to the left ventricle's feebleness, rather than by edema and back pressure consequent on relative mitral regurgitation, then I am emphatically of the opinion that digitalis must be given with caution." He cites the following case: The man had aortic insufficiency with failing compensation. He says: "Edema was not present, yet the state of the heart seemed to call for heroic doses of digitalis in the forlorn hope of lessening the dilatation of the left ventricle. Instead of doing this, however, the digitalis appeared to aggravate the back pressure, and at last death came suddenly and unexpectedly."

There is no more eminent authority on heart disease than Dr. Babcock. If you will follow him closely you will note that he qualifies to a great extent, the reference to digitalis in the treatment of aortic insufficiency with failing compensation. He wants a string tied to the digitalis so that he can guide it.

In my own experience, as I said at the outset, I can see no rational reason why digitalis should be given in this great valvular lesion. Broadbent says in his book on diseases of the heart: "In the absence of mitral symptoms it is rarely that digitalis is indicated in aortic incompetence or is of service, and it may undoubtedly do harm. It may set up sickness, which is an ominous symptom in this form of disease and induces a condition of asthenia difficult to remedy."

In my opinion, this argument as set forth above can best be applied in aortic incompetence where mitral symptoms are present. There is more reason for discrimination as to the indications for digitalis in these two valvular lesions than there is for the administration of quinin in the various malarial disorders. The subject has always been of particular interest to me, and I have reached the conclusion, after a careful study from bountiful clinical material, that there is but one valvular lesion where digitalis is indicated, and that is mitral insufficiency, and not until compensation has failed.

Tuberculin in Diagnosis.—The *Beiträge zur Klinik der Tuberkulose* is a new periodical, just entering its second volume. It is issued by Professor L. Brauer of Heidelberg. No. 4 contains an article by Bandelier, of the sanatorium at Kottbus, who states that out of 500 persons to whom the tuberculin test was applied, 92.6 per cent. responded positively. All those who failed to exhibit the specific reaction have remained apparently healthy to date. Out of 114 patients tested as they left the sanatorium, 38 per cent. gave no reaction, and 22 of these patients, tested again twelve to twenty months later, were found permanently cured with but 2 exceptions. He urges the application of the tuberculin test as a current measure, not only by specialists, but in hospitals and in general practice. In order to have a uniform standard for comparison he pleads that Koch's technic should be followed.

SOME POINTS IN THE ACOUSTICS OF RESPIRATION.*

CHARLES E. QUIMBY, M.D.

NEW YORK CITY.

The first attempt to define, even relatively, the pitch of respiratory sounds was made by the late Austin Flint in a prize essay published in 1852. The opening sentences of that essay are as follows:

Very little attention has hitherto been paid to variations in pitch of sounds heard in the practice of percussion and pulmonary auscultation. By most writers on physical exploration pitch modifications, except in râles, are not recognized, no allusion whatever being made to them.

Flint makes essentially no attempt to explain the production of respiratory sounds, or to offer physical evidence in support of his purely dogmatic affirmations. His statements as to the pitch of normal and pathic respiratory sounds, quoting verbatim, are these:

On placing the stethoscope over the trachea the respiratory sound is found to be notably high in pitch. The relative altitude of pitch is immediately perceived on comparing the tracheal sounds with the vesicular respiration, heard on listening over the chest. Two sounds are heard uniformly in this situation, viz., inspiration and expiration. The sound of expiration is higher in pitch than that of inspiration. In vesicular respiration the pitch is uniformly and notably lower than that of tracheal and bronchial respiration. The pitch of the bronchial sound is high, probably not much below that of the tracheal sound. In the more important elements the tracheal and bronchial sounds are similar; they are both high in pitch, and the expiration in each is higher than inspiration.

The foregoing statements, made over fifty years ago are identical with those found in the standard works on physical diagnosis to-day, and have evidently been accepted through the intervening years by one author after another without question or investigation.

In a former article[1] I presented a comprehensive discussion of the laws governing the formation of respiratory sounds and their pitch relations, and, as I believe, not only demonstrated the fallacy of accepted beliefs, but established, on a strictly physical basis, the truth of the exactly opposite propositions regarding the pitch and pitch relations of such sounds.

It is the purpose of this present paper, reserving the right of reversion to the former article for exactness of statement under criticism, to present anew, in brief outline, a demonstration of the following propositions:

1. The tracheal note represents the inferior pitch limit of respiratory sounds, and that limit may be defined by a letter of the musical scale, as may every other respiratory pitch.

2. In vesicular respiration the inspiratory sound represents the superior pitch limit of respiratory sounds.

3. The passage from vesicular respiration to bronchial breathing is attended, at first, by a lowering in pitch of the inspiratory note, and later by lowering of both inspiration and expiration.

4. In vesicular breathing the inspiration is of a higher pitch than expiration; in rude, bronchial and tracheal breathing the inspiration is of a higher pitch than or the same pitch as expiration. There is no respiration resulting from consolidation in which expiration is of higher pitch than inspiration.

In the proposed demonstration it is necessary to consider first the formation of respiratory sounds. Whatever modifications they may undergo later, there can be no question but what they depend primarily on vibrations excited in the respiratory air column by its motion through the tubes. Any such confined column of air will be thrown into sonorous vibration when it meets or passes an obstruction whereby it is suddenly compressed. Such points are found in the respiratory track only at the larynx and bronchial bifurcations. At the larynx sonorous waves are produced by the primary compression of the air in passing the vocal chords, and the subsequent expansion as it enters the laryngotracheal tube; at the bronchial bifurcations similar waves are developed, on inspiration, by the deflection and compression of the air column, and on expiration by the impact of the two columns of air as they meet in a common tube. Now, it is an established law of acoustics that the pitch note of any vibrating column of air is determined essentially by its length, and that the greater this length the lower the resulting pitch note. In stating this law I am not unmindful of the measures employed by musicians in tuning such instruments as the clarinet and flute; they are but seeming contradictions of this law. Hence, since pitch depends on length, the only supposition under which normal or vesicular respiration could be of low pitch, and bronchial breathing of higher pitch, would be that the respiratory air column vibrates as a whole from the larynx to the ultimate tubes, which column would be at its longest, i. e., lowest pitch in health and shortest, i. e., highest pitch when its terminal was cut off by consolidation of the lung.

If this were the case, however, there could not be two notes in the same tube, and vesicular and tracheal respiration must be of the same pitch, which we know is not true. It is also made an impossibility by the physical conditions, since there is no constant tube length from the larynx to the terminal tubes, and the main air column could not vibrate in harmony with the various terminals. Moreover, we know that a sonorous air column vibrates as a unite only within the limits of uniform compression. These limits within the lung are the points of bronchial bifurcation. It is thus evident that the normal respiratory sound, as heard at any given point, is a composite sound made up of the tracheal sound and an added term from each and every tube in the line of passage to and within that part of the lung under examination, and that each and every one of these component sounds has its own fixed pitch, determined by the length of the tube in which it is developed. By reason of the manner of bronchial bifurcation the notes of the several components of this sound may fairly be represented by lines, of which one represents the trachea, progressively shorter ones the single branches, and multiple short lines the terminal tubes. Now, of these component notes, which combine in normal respiration and which represent all the possible respiratory notes, the trachea is the longest, and hence gives the lowest possible pitch note to be heard in respiratory sounds. Whereby is established the first of our propositions. For proof that the pitch note of this sound is, in the majority of persons, not far from G of the musical scale, I could quote high musical authority, but prefer to leave it to the decision of your own musical friends.

In considering the question of pitch in the composite sound of vesicular respiration it is evident that there are three possibilities:

1. These several components may be heard separately or in groups, thus making vesicular respiration not one but two or more sounds, each of distinct pitch. As it

*Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Practice of Medicine, and approved for publication by the Executive Committee: Drs. J. M. Anders, Frank Jones and W. S. Thayer.

1. Medical Record, March 25, 1893.

most certainly is not thus heard by the majority of diagnosticians, we leave this contingency as not pertinent to the present discussion, merely stating that it is the case with those whose ears are acutely trained in the differentiation of pitch.

Assuming, then, that but a single sound is heard in respiration, its pitch must be determined by some one or by a combination of similar pitched components about which all the others are gathered as quality. This dominant tone or tones will be that which reaches the listening ear with the greatest intensity.

Therefore, we have for our other possibilities: 2. One of the single notes, either that of the trachea or a primary bifurcation, may dominate the multiple short tube notes, in which case vesicular respiration will be of relatively low pitch. 3. The multiple short tube notes may, by reason of their combination, be the louder, in which case vesicular respiration will be not only relatively high, but the highest pitch respiration to be heard. Which of these possibilities is the truth can be determined only clinically by the ear. But leaving that point for the moment, some conclusions can be deduced from what has already been shown.

It is obvious that, if the second assumption be true and vesicular respiration of low pitch, whether from the trachea or an early bifurcation, the short tube high pitch sounds are heard only as quality of the respiratory sound and their elimination under the processes of consolidation can only affect quality, and can not by any possibility make the resultant bronchial breathing of higher pitch than was the vesicular. On the other hand, if the third assumption is the correct one, and vesicular respiration is of high pitch, by reason of the dominance of the multiple combined short tube sounds, then their elimination by consolidation can only leave the longer tube low pitch notes to supply pitch for bronchial breathing.

Hence, under either contingency, vesicular inspiration represents the highest pitch of any form of breathing; it being under the second assumption, that of one of the single branches, and under the third relatively high from the terminal tubes, but in neither case admitting the possibility of a rise of inspiratory pitch during the consolidation of the lung.

A justification for the decision of the ear in favor of the third possibility is found in a consideration of the factors determining intensity of the inspiratory notes. As the air current is more rapid in the trachea and primary bronchi, their notes are primarily the more intense. Each of these notes, however, is single and suffers a loss of both intensity and clearness by interference as its waves pass into succeeding tubes, while the terminal tube notes not only suffer no such disturbance, but gain relative intensity by their number and production close under the listening ear. It is thus that vesicular inspiration becomes not only relatively and absolutely of high pitch, but of the highest respiratory pitch to be heard, which gives the justification for our second and third propositions.

Turning now to expiration, we see, since this must be a composite sound, formed in the same manner as inspiration, that an expiration of higher pitch than inspiration requires the development of multiple dominant notes in still shorter tubes than on inspiration.

Two things, however, render this impossible. First the manner in which sonorous vibrations are developed at any given bronchial bifurcation. On inspiration this is by impact of the air on the sharp, firm junction of the bronchial walls, conditions most favorable to the production of such vibrations; on expiration it is by the collision of the two columns of air from the distal tubes, conditions most unfavorable to the production of such vibrations. Hence the note produced at any given point must be more intense on inspiration than expiration; and for this cause alone, other things being equal, it is evident that the distal point of sound production must be deeper in the lung, i. e., in shorter tubes, on inspiration than on expiration.

Second, the intensity of sonorous vibrations depends, other things being equal, on the pressure or rate of flow of the air column. This is greater on inspiration than expiration, so that both factors of intensity thus combine to make the point of ultimate sonorous vibrations in respiration such as will give an expiration of lower pitch than that of inspiration. What acoustics thus demonstrates to be a necessity the ear confirms clinically, and establishes the fourth and last of our propositions in so far as it relates to vesicular breathing.

It can hardly be necessary to repeat the demonstration for rude or bronchial breathing, since the same conditions governing intensity are in force after the elimination of the short tube notes, until the sound heard is purely a transmitted note from some tube without the affected lung. In such a case the inspiratory pitch may fall until it is the same as that of expiration, but it is impossible that it should fall below the expiratory pitch. Thus we have established our final proposition for all forms of respiration.

A brief word as to the manner in which inspiratory pitch falls under varying grades of consolidation. If the bronchial bifurcations, and the consequent notes which they contribute to the respiratory sound, were in geometrical ratio, i. e., two at the first, four at the second, and thus on through, say, eight, sixteen, thirty-two and sixty-four, and it was found that sixteen tubes, of any one note, were sufficient to dominate the lower notes, it would then be easy to see that normal inspiration must have the pitch of the 128 notes, and that, as consolidation advanced from the surface, the inspiratory pitch would drop successively and gradually through the pitch of the 64 and 32 to that of the 16. But our assumption as to bifurcation is not true; for, in fact, the bronchi, and hence the respiratory notes, going to any given part of the lung, show two, or at the most three, large single branches and then a multitude of very small ones, the difference between these last and the single branches being extreme from the acoustic standpoint. As a result the dominance of these high pitch tubes in the respiratory sound is not destroyed by the occlusion of a portion of the number; but when such pitch control is finally lost by more extensive occlusion the change in inspiratory pitch is not gradual, but by a sudden drop to that of one of the large single tubes, while such small tubes as may still give sonorous elements now appear in the respiratory total as quality. This explains how certain grades of rude respiration, which means retention of higher pitch notes without pitch dominance, may have a pitch nearly if not quite so low as that of pure bronchial breathing. With this change the pitch relations between inspiration and expiration remain unchanged. Indeed so convinced am I that no form of pulmonary consolidation can give a respiration with relatively high pitch expiration, that for nine years I have had a standing reward at the City Hospital for a case showing such respiration. That reward has yet to be claimed.

Twice, however, in ten years I have heard such pitch relations in what was apparently, for the individual, nor-

mal respiration. In each case it was evident that the expiratory pitch was due to a peculiarity in the second branch on the right side, whereby the inspiratory high pitch notes were weakened and the expiratory current from the lower lobes impinged on the angle of bifurcation, as is the rule in inspiration.

CONCLUSIONS.

In conclusion, I beg to answer the question so commonly asked: "Admitting all this to be true, of what good can it be to revise all our ideas, since men are making diagnoses by present methods?"

To this I reply: 1. If it is the truth, it should be known, accepted and taught. 2. It makes available for purposes of diagnosis the full value of the element pitch in respiratory sounds, which, if the position taken is correct, has never been so employed heretofore. 3. An experience of fifteen years in the teaching of physical diagnosis, making practical use of these principles with students, has shown that it enables students to acquire a far greater skill and confidence in diagnosis, within a much shorter time, than under the present methods of teaching.

DISCUSSION

ON THE PAPERS OF DRS. STEELE, GREEN, JONES AND QUIMBY.

Dr. James Tyson, Philadelphia—We should bear in mind that "the proof of the pudding is the eating," and I will simply state what I am doing in cases of aortic regurgitation with loss of compensation, which means that there is also regurgitation at the mitral orifice. My first step is to place the patient in bed; I believe one-half the battle is won by securing a complete relaxation and reduced demand on the heart—taking off the breaks as has been suggested—and this can often be accomplished only by rest in bed. In bad cases I fortify this treatment with small hypodermic injections of morphin, scarcely ever exceeding one-eighth of a grain, with probably some atropin added which softens the effect of the morphin. These two measures will sometimes produce the most satisfactory and even unexpected results. Having done this we are prepared to take more active measures toward the relief of the dropsy, and this can be done by active purgation; I go even further than this sometimes and puncture the dropsical tissues to allow the fluid to drain off and relieve the tension. After this is done, and compensation remains unrelieved, I add digitalis, not in large but in small doses, say five minims every four hours, slowly increasing the dose, after waiting a reasonable time to get the primary effect. I think very often physicians want to see the effects of digitalis before they should expect it. I prefer to give moderate-sized doses and then wait two, three or even four days sometimes; after which, if there is no contraindication, I may increase the dose. In this way I think digitalis is helpful. Dr. Jones' illustration of the forward and backward movement of the crab is applicable, but I do not think the parallel is exact. Of course, if there was an equal balance between the regurgitation at the mitral orifice and that of the aortic orifice, i. e., if the blood came back as much as it went forward, his position would be strikingly sustained; but so long as there is a chance of getting the blood to go forward more strongly than backward, I think we are justified in using digitalis. I believe the general principles announced by Dr. Jones are correct, and I agree with him, but I think we meet many cases which are successfully treated with digitalis, when there is mitral regurgitation with loss of compensation associated with aortic disease.

Dr. Richard Cabot, Boston—Experience seems to show that digitalis may do good in uncompensated mitral disease, stenosis or regurgitation, in the vast majority of cases, and that it does not do good in aortic regurgitation. I think a distinction should be made within the group of cases, known as aortic regurgitation; in elderly persons, with degeneration of the arteries and with high peripheral tension digitalis will do harm; but there is another and much smaller group of cases, occurring usually after rheumatism and in young persons. In this group the disease attacks primarily both valves, mitral and aortic, the change being not merely a muscular one, but affecting chiefly the valves. Here digitalis will do good, though not so much good as in cases of primary mitral disease. I was struck with one of Dr. Jones' figures about trying to haul a train up hill with the brakes on and with very little steam in the boiler. Better let off the brakes than to try to make the engine do more work. Better lower the peripheral resistance, if it is high, than try to stimulate the heart. I have seen many cases where compensation had failed, and yet the heart seemed to be pumping strongly. In these cases good results may be obtained by using purgatives and diuretics, and, when the dropsy is reduced, digitalis. We should first deplete, reducing the load, and letting off the brakes; after that stimulation may be followed by improvement. I take issue with Dr. Quimby in all the points he has raised. Music has interested me for many years, and particularly matters of pitch, and I wish to state that before writing my book on "Diseases of the Chest," I went through Flint and verified point by point everything that he stated regarding the pitch or respiratory sounds. Dr. Quimby is of the opinion that the pitch of bronchial breathing ought not to be higher than that of vesicular breathing, but he does not prove that to be the case. My ear tells me that bronchial breathing is higher than vesicular breathing. Also, it is my experience and that of my friends with musical ears that in bronchial breathing the expiratory sound is usually higher in pitch than the inspiratory one. Therefore, I believe that what Flint has stated in his book is correct. Anyone who is to consider this subject should have a musical ear, and should not base his remarks on the theory of the production of sound.

Dr. DeLancey Rochester, Buffalo—I am in accord with what Dr. Jones has stated regarding the use of digitalis in mitral and aortic insufficiency. I think Dr. Tyson will get better results with rest in bed than by placing his patients on digitalis in cases of aortic insufficiency. There is one thing I wish to disagree with: Dr. Jones stated that the only place for digitalis was in failing compensation in mitral insufficiency; if he had stated "mitral disease" I would have agreed with him. I think it has a great use in mitral obstruction. In mitral obstruction the heart has great difficulty in forcing the blood from the left auricle to the left ventricle; digitalis will lengthen the time of diastole and will energize systole. Therefore the auricle is given more time in which to empty itself. I think that there is a clear indication for digitalis in mitral obstruction. We do not give drugs in cardiac diseases simply because we find a murmur; the use of drugs should be controlled by the condition of the circulation and evidences whether or not it is failing. I am glad that Dr. Cabot took issue with Dr. Quimby; I also take issue with him, and I agree entirely with Dr. Cabot. Change of pitch is more easily recognized in the violin than in any other instrument known, and I must say that, clinically, Dr. Quimby is wrong in the position he takes in this matter.

Dr. S. C. James, Kansas City, Mo.—A very unfortunate element in the make-up of the heart is the fact that the valves are too close together; if I had the making of a heart I would like to separate the valves, five or six inches, then we western doctors would know when to use the whip, digitalis, and when not to use it. The average physician, when he comes in contact with a case of heart disease, immediately thinks of digitalis. I think that digitalis has done more harm in the world than it has done good. On the other hand, I think that digitalis is one of the grandest remedies in the hands of medical men today. The lack of the intelligent use of this drug has placed many an unfortunate, though trusting patient, in his coffin. If the cardiac condition were more carefully studied by the physician he would know better how and when to use digitalis. I think if I was to lay the whip on a horse I would not do it at the foot of the hill. I believe in the use of blarney; by its use a horse may be much encouraged and helped in pulling his load. Digitalis should be used, but with intelligence. I believe,

too, in taking off the brake, and, as Dr. Tyson says, use digitalis moderately and with a great deal of caution.

DR. EDWARD F. WELLS, Chicago—In the discussion and reading of Dr. Jones' paper it must have been clear to everyone that the keynote to the situation in failing compensation in cardiac disease, so far as the management of the condition is concerned, is that of opportunity. In the severer cases of lost compensation our opportunity for doing good is sometimes remarkable. Take, for example, a man who has been sitting in his chair for days, with no sleep, with advancing swelling of the limbs, labored breathing, etc., and the management of such a case should be something like this: Minute doses of morphin, 1/16 of a grain, administered hypodermically, will allow the patient to sleep for hours. Cathartics should be given, and watery bowel movements should be obtained by giving elaterium, 1/8 or 1/10 grain doses every three hours, until eight or ten watery movements have been produced. Then, if necessary, several punctures may be made in the feet or legs and you may allow quarts, or even gallons, of water to pass off within twenty-four, forty-eight or seventy-two hours. Now comes the opportunity for the use of digitalis, and with the greatest benefit. I am sure that if the members of the section will review their experience they will corroborate all that I have said.

DR. JOSEPH SAILER, Philadelphia—Dr. Steele's theory of the causation of hydrothorax is not capable of direct proof, and, therefore, depends on the accumulation of presumptive evidence. There are certain facts which appear to be against it. I believe that in the majority of cases of cardiac disease, hydrothorax is present when the left auricle is distended more than the right. This opinion is based on careful percussion and examination of the heart. Moreover, it is difficult to understand how sufficient pressure can be made on the vena azygos major to obstruct it without producing symptoms of pressure on some of the other important viscera of the thorax. The dilatation of the cutaneous veins on the right side, which we should expect to occur on account of their anastomosis with the branches of the azygos vein, is not present, and, as Dr. Steele has said, the theory is hardly applicable to the left-sided cardiac hydrothorax, although there is little reason to believe that the etiology in the two conditions is different. In regard to Dr. Jones' paper, it has been my experience that aortic disease is more common than mitral disease, the proportion being about three to two. When severe edema occurs in the course of aortic regurgitation and fails to clear up in three or four days after the patient has been put to bed, the prognosis is extremely grave. Dr. Cabot spoke of taking off the brakes. The older writers, commencing with Laennec, used venesection freely and apparently with great benefit. In those cases in which I have used it I have never known bad results.

DR. ALFRED T. LIVINGSTON, Jamestown, N.Y.—The heart, as a pump, is a peculiar pump, being practically two double pumps combined and connected with each other. One of the peculiar conditions which makes it differ from an ordinary pump is that it does not pump from a reservoir to a given point, but from the termination of one circuit into the beginning of the other. Now, it is generally conceded that disorders of the heart have their primary cause in disturbances of the circulation. If the two circuits are in perfect condition the pump will have easy work to perform and will not get out of order. If it does get out of order, it is because something has gone wrong in one or both the circuits. Therefore, it seems to me that the primary indication is to correct the abnormal conditions in the circuits. Digitalis has been spoken of by Dr. Jones as acting on the general circulation, but he regards it as a difficult creature to control and, therefore, to be used only with great skill. My general experience with ergot leads me to say that I find it to be the best drug for correcting the fundamental conditions on which these cardiac difficulties arise. Its action is certain, and is chiefly on the disordered tissues, unstriped muscular fiber; in using it you need not stop to consider where the circulation is disturbed. If an overdose be given it will not do harm. Its effect is to tone and contract the relaxed unstriated muscular fibers in the walls of the blood vessels from the crown to the toe; in so doing it helps the circulation. I am quite sure that you will agree with me, when I say that if the general circulation is helped the heart will have a better chance to recover itself.

DR. GEORGE W. WEBSTER, Chicago—Dr. Jones has stated that digitalis should not be used in any case of aortic regurgitation; here I think we should discriminate and think of the condition which causes it. In aortic regurgitation, when this is the only valvular lesion present, it is, as a rule, due to syphilis and, therefore, is often accompanied by a general arteriosclerosis; here there might have been a widespread disease that started in the blood vessels and ended in the aortic valve. On the other hand, aortic regurgitation is frequently found as a complication of, or exists with, other valvular disease, an obstruction at the aortic valve, as well as a regurgitation. We should differentiate carefully between these cases of aortic regurgitation due to infection and aortic regurgitation secondary to syphilitic infection. In the latter, Dr. Jones will find that where there is a general arteriosclerosis of specific origin, there is no drug in the materia medica capable of doing more harm than digitalis. On the other hand, where there is a simple infection and involvement of the aortic valve, or an involvement of the mitral valve as well, without involvement of the heart muscle, blood vessels, or kidneys, then it is possible to show that digitalis not only may but occasionally does good. I think we should discriminate more than we do.

DR. J. M. ANDERS, Philadelphia—Hydrothorax is a form of dropsy, or venous stasis, dependent on a passive hyperemia. For its production there must be some obstruction to the venous circulation, and on the distal side of the obstruction fluid exudes from the lumen of the small veins. The reason dropsy begins in the feet is because the venous obstruction is here reinforced by another causative factor, i. e., the effects of gravitation. In hydrothorax the influence of gravitation is not manifested, and yet we have all met with cases of pleural dropsy in which general dropsy was slight, or even entirely absent. For an explanation of some of these cases, at least, it seems to me that the theory advanced by Dr. Steele is tenable, namely, that within the thorax there is an obstruction to the venous circulation produced by abnormal pressure by the enlarged heart on the azygos veins. Popoff and other clinical observers, and I myself, have observed inequalities of the radials in valvular disease of the heart, and I think this is explained by assuming that the right auricle exerts pressure on the large vessels within the thorax. It is reasonable to suppose that the azygos veins might be pressed on and produce hydrothorax, although absolute proof is still wanting. Cardiac dropsy is more common on the right than on the left side of the thorax, although it may be more marked on the left than on the right side. Recently I saw a case in which it was confined entirely to the left pleural cavity. There is a principle in the treatment of hydrothorax that should not be lost sight of. When a cure results some of the fluid is obviously absorbed through the lymphatics; but it should be borne in mind that the fluid in hydrothorax is very poor in proteids, and may, therefore, be absorbed also through small veins. As a matter of fact, there is no better way of getting rid of the dropsical fluid in hydrothorax than by systematic daily purgation by means of saline laxatives. Venesection has a similar influence and exerts its good effects in the same way. These measures rid the blood vessels of some of their serum and thus stimulate absorption from the pleural sac through veins and lymphatics to replace that which has been lost. This should be done before the administration of digitalis. The delirium which occurs in chronic heart disease is difficult to explain. I have seen a number of cases which occurred after failure of compensation and where there was a general venous stasis. I had occasion not long since to state that venous stasis should be looked on as a pathologic condition; it means, as Lazarus-Barlow has pointed out, starvation of the tissues, the retention of waste products, and finally an anatomic alteration in the various viscera in the body; in just the same way as we have disturbances of the liver, gastrointestinal tract and the kidneys, so we may have disturbance of the function of the brain, or delirium. There is

another class of cases in which a different causative factor is at work; I refer to the blood changes—the toxic materials in the circulating blood. These may produce heart lesions and general arteriosclerosis, and this sclerotic process may affect the cerebral vessels. Here, coexistent cardiac disease and delirium may be met with before rupture of compensation has occurred. In these cases I think the delirium is rather due to arterial changes within the brain than to any cardiac lesion *per se*, and that both of these organs suffer in consequence of the action of a common cause, namely, the altered blood state. I believe with Dr. Webster that we should classify our cases of aortic regurgitation into those due to endocarditis and those due to general degenerative changes before we begin to use any special method of treatment. I agree with Dr. Jones that in aortic regurgitation, with marked arteriosclerosis, it is bad practice to give digitalis, and especially unguarded; in these cases it should be used cautiously only when indicated, and be guarded by the use of the nitrites or nitroglycerin, so as to diminish the arterial resistance.

Dr. N. R. Coleman, Columbus, Ohio—There are conditions in which digitalis does good; this has been my experience. When we have a condition approaching a normal cardiovascular system, then we may secure good results from the cautious use of digitalis; but if there is a degenerative change in the blood vessels, such as an arteriosclerosis, or some marked change in the heart, such as a granular degeneration, then digitalis will not only do no good, but in the majority of cases it will be found to be a dangerous agent. I take issue with Dr. Quimby's theory. While I am not a musician, I believe my ear will detect matters of pitch pretty correctly. I have studied physics, and especially acoustics, with care, and I do not believe the normal vesicular murmur is higher in pitch than the bronchial or tracheal respiration. I will even go farther and say that the tracheal and bronchial expiration is higher than the tracheal and bronchial inspiration sound.

Dr. J. Dutton Steele—I agree with both Dr. Sailer and Dr. Anders in thinking that there has been no theory thus far advanced that can be called entirely satisfactory, to account for pleural effusions in heart disease. The theory that there may be some pressure on the various venous trunks within the thorax causing congestion and consequent effusion of fluid has a wide acceptance. The vena azygos major curves around the root of the right lung and is, therefore, specially liable to be compressed. The only point of practical value that can be drawn from our present knowledge of the subject appears to me to be that long-continued congestion may cause effusion, not as a mere obstruction to venous circulation, but by reason of the long-continued congestion causing some atrophic change; therefore, the effusion may not be entirely a transudation, but an exudation, and therefore in these cases of hydrothorax I think we had better not wait and give purges, digitalis, etc., to relieve the dropsy, but do early and frequent tapping.

Dr. F. M. Green—As has been stated in the discussion, the cause of the delirium in pericarditis may be, 1, from hyperpyrexia, which generally exists in these cases; 2, from venous congestion; 3, from the existence of some toxemia in the blood. The fever, however, was not exceedingly high in the case reported, and the delirium seems to have been caused by venous congestion.

Dr. Frank Jones—I was glad to hear what Dr. Sailer said regarding the frequency of mitral and aortic lesions. It has happened to me to encounter more aortic lesions than mitral. My experience has not been in keeping with the text-books in this respect. In regard to Dr. Wells' statement regarding the general types of aortic insufficiency and the conditions which bring them about, I wish to say that, according to my own observation, when it occurs in early life the prognosis is invariably good. In the endocardial form, the integrity of the heart muscle is not necessarily lessened; the coronary vessels are intact and the circulation is clear. With regard to the remarks of Dr. Tyson, I understand the position he takes in reference to the injudicious use of digitalis. Particular stress should be laid on its use in approaching dissolution, when there is sleeplessness, dyspnea, much anxiety, etc.

Dr. C. E. Quimby—I am neither surprised nor disturbed that the gentlemen take issue with my statements. I only regret that they have been unable to meet a logical demonstration of specific propositions with anything more interesting or pertinent than dogmatic personal opinions, as it affords me no opportunity for a reply.

INTRACRANIAL NEURECTOMY FOR TRIGEMINAL NEURALGIA.

CASES AND COMMENTS.*

HARRY M. SHERMAN, M.D.
SAN FRANCISCO.

At this time and place one may not report opinions or cases which are merely conventional, and the report of the following five cases in four patients is permissible only because of the exceptions to the rules in two of them. All were cases of trigeminal neuralgia, in all the pain had been of considerable duration, and had gradually become so severe as to be unbearable. In all four patients the third branch was involved, in two the second branch as well, and in one all three branches. In two patients the results were conventional. Complete and lasting relief followed the operation. In two patients, one of whom had two operations, there were exceptional, unconventional accompaniments.

In the first case the exceptional element was a complete and permanent paralysis of the facial nerve, noticed first the morning after the operation. In this patient the pain had been limited to the third branch, but the intention at the time of the operation had been to remove the entire ganglion. However, all that I did remove was the outer half of the ganglion with the second and third branches to their foramina of exit. The wound healed aseptically, the pain was gone, but the seventh nerve was paralyzed. Studying the possible traumatisms to the nerve during this operation, it is easy to exclude pressure on the pes anserinus, as the operation was done six or seven years ago, and on the lines of the original Hartley-Krause technic, so the zygoma was not cut and it stood between the nerve and any instrumental pressure by retractors; indeed, the osteoplastic flap of skin, muscle and bone was folded down over the zygoma and protected this very area. On the other hand, while it is possible to reach back, inside the skull, into the posterior fossa, it is not conceivable that I let my finger wander so far as to pick up and tear the seventh nerve before it entered the petrous bone, and I am, moreover, certain that I did not do this. Finally, the man has had no trouble with his ear, nor anything to indicate disease of nor injury to the nerve during its passage through the bone.

Excluding trauma to the nerve in its superficial location, put the case outside that class, of which Pershing wrote and to which Wyeth the other day referred, and in which pressure or pull on a superficial nerve during the period of anesthesia resulted in temporary or permanent paralysis. It is a satisfaction to do this, for the advent of the paralysis suggested this as the first and most obvious explanation and had it proved to be the true one, it would have had to be accepted as a fault in technic. The integrity of the nerve before the operation and the lack of any pathologic ear or temporal bone process make it most probable that some injury inside the skull caused

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Surgery and Anatomy, and approved for publication by the Executive Committee: Drs. DeForest Willard, Charles A. Powers and J. E. Moore.

the condition. I am aware that a man working by touch in the dark may easily reach farther than he intends, especially if he does not keep his eye on the external wound, but in this case the work was done by sight and not by touch, so that I can be sure an errant finger did not do the damage. The case was reported in THE JOURNAL some months ago, but no explanation has been offered and for this reason I include it with the other operations and submit it for discussion.

In the other patient the pain began in the supraorbital branch and was associated with an attack of herpes facialis. Primarily it acted as a definite neuralgia and the nerve was cut finally just above the orbit, but without giving relief. Then, because of a history of plumbism some years before, which had yielded to potassium iodid, because of miscarriages by the patient's wife, and because of non-response of the pupils to light, the potassium iodid was again given in doses of 5 grm. daily, with no local relief and with a distinct loss in general health. Thus the consideration of the case took cognizance of syphilis, but as treatment for syphilis proved of no avail, and as the pain had extended to include all three branches, an exposure of the ganglion was decided on. It was also decided to cut the root of the nerve behind the ganglion and to go no further, unless some distinct pathologic process like a gumma should disclose itself. That this might be the outcome was the hope of Dr. Clark J. Burnham and Dr. L. Newmark, when they turned the patient over to me.

As I intended merely to cut the root, as has been practiced by Frazier, I prepared for the possible cutting of the sensory root only, so made my incision to circumscribe the temporal muscle. The muscle was then separated as a whole from the pericranium down to the point where the bone was to be cut. This also avoided unnecessary stripping of the pericranium from the skull in a putative syphilitic. At the proper level, about 1.5 cm. above the zygoma, the pericranium was cut and the skull bared. The zygoma was left untouched. A small trephine opening enlarged by rongeurs gave ample room, the exposure of the ganglion was uneventful and the fasciculi of the root were hooked up and cut, the cutting causing a reflex movement by the patient. It was not possible to discriminate between sensory and motor filaments, but the fact of the section of the entire root was satisfactory and the ganglion was tipped forward out of its bed to make this proof clear.

On coming to close the wound it was seen that the brain did not expand immediately to occupy its original space, and so, to avoid leaving an air space in the skull, normal salt solution was poured in and the head rolled over so as to keep it there while the suturing was done. For two days the man was free from pain and there was paralysis of the temporal and pterygoids. On the third day, however, he began to have pain, and this pain gradually increased in its old area and intensity. For two months the anesthesia, to light touches and to pin-pricks over practically the whole of the area of the fifth nerve, persisted and was verified by several examinations, while the temporal and pterygoid paralysis also persisted. In the third month sensation returned, to my surprise, and light touches and pin-pricks could be felt everywhere over the whole area excepting the supraorbital branch area which had been anesthetic from the time of the superficial section of that nerve. The sensation as it returned was not of normal intensity. It was described as being dull, but it was demonstrably present and evidenced a union of the cut nerve root beyond any doubt. The paralysis of the pterygoids, however, persisted.

This is the supposedly exceptional point in this case. I do not know the number of cases operated on by Frazier and others in which the nerve root alone has been cut and nothing interposed between the ends, as was suggested by Abbé, but I was impressed with the simplicity of the plan when Frazier, on Spiller's suggestion, tried it and with apparent success. I report this case to call attention to the fact, which I am obliged to accept as proven, that the nerve root may unite and resume its function, and that this most simple operation is not, in itself, to be wholly trusted for the production of an anesthesia and an analgesia which will be permanent

Because of the persistence of the pain, and also and chiefly, because of the return of sensation, I again exposed this man's gasserian ganglion, three months after the first operation. The point of interest here for me was the possibility of encountering such firm adhesions of the dura mater to the bone as to interfere with the operation. I followed, from the skin to the ganglion, the old line of operation. The incision was, therefore, wholly in scar tissue, which nowhere was it impossible to discern. The dura mater was but normally adherent to the bone and consequently separated easily, and I attributed this to the salt solution, which presumably did not absorb quickly, which diluted any escaped blood, and so resulted in a light areolar tissue bond between dura and bone. A little hook, passed under the root of the fifth nerve, behind the ganglion, demonstrated that the ends had, by some kind of a bond, anatomic or cicatricial, united. The union was broken, the ganglion tipped forward and wholly removed. Salt solution was again poured into the skull and the wound again closed and healed aseptically.

There is now a permanent anesthesia to tactile, heat, cold and pain sensations, except along the borderline between the fifth nerve distribution and areas of contiguous nerves, a line that is never a typical one and which permits, because of its anatomic irregularity, of easy explanation of physiologic anomalies. It may be added that in this last operation the zygoma was cut and pushed down, but that the addition to the field of view did not seem to me to be great.

Since this second operation the patient's subjective pain has continued unabated.

REMARKS.

The points of the case are the variations of the incision so as not to injure the fibers of the temporal muscle nor strip more than the necessary amount of pericranium from the skull. The use of physiologic salt solution to fill the space to be occupied by a slowly expanding brain and exclude air. The fact that a ganglion can be exposed a second time, three months after the first time, with no difficulty and no hemorrhage, by following the lines and planes of the first incision. Finally the fact, on the evidence of this case, that the cut root of the fifth nerve may unite and resume its physiologic function. Other cases may be added to confirm this statement, but even if they are not forthcoming the fact of union in this one case can not, to my mind, be gainsaid.

Dr. Hoffa's Tribute to American Surgery.—In Dr. Hoffa's recent visit to this country he found much to commend in American surgery. He was greatly impressed with the completeness of American hospital appointments, especially the corps of nurses found in every large hospital. He praises the nurses for their intelligence and efficiency.

PHYSIOLOGIC EXTIRPATION OF THE GANGLION OF GASSER.

FURTHER REPORT ON DIVISION OF THE SENSORY ROOT FOR TIC DOULOUREUX, BASED ON THE OBSERVATIONS OF FOUR CASES.*

CHARLES H. FRAZIER, M.D.
Professor of Clinical Surgery, University of Pennsylvania; Surgeon to the University Hospital.
AND
WILLIAM G. SPILLER, M.D.
Professor of Neuropathology and Associate Professor of Neurology, University of Pennsylvania.
PHILADELPHIA.
From the William Pepper Laboratory of Clinical Medicine (Phœbe A. Hearst Foundation).

REMARKS BY DR. FRAZIER.

In June, 1901, three years ago, I reported to the Section on Surgery of the American Medical Association then in session at St. Paul, the results of a series of experiments on dogs conducted by Dr. Spiller and myself, with a view toward determining the feasibility of dividing the sensory root of the gasserian ganglion for the relief of tic douloureux.

RESUME OF EXPERIMENTAL WORK.

These experiments consisted in carrying out this operation on a number of dogs and subjecting the structures removed several months later to a rigid histologic examination to determine whether regeneration of the sensory root after simple division could occur. The results of these investigations admitted of but one interpretation, namely, that there was not the slightest evidence of regeneration within the central nervous system. More recently,[1] Dr. Spiller and myself pursued this line of investigation in a series of experiments on the sensory roots of the spinal ganglia with equally positive results.

Having established by experimentation in lower animals beyond a peradventure of doubt the inability of the sensory root to regenerate at least within the central nervous system, it only remained to obtain equally positive results in the human subject before any substantial claims for the operation as a rational, practical and "tried-out" procedure could be made. These we present to-day as a result of our experiments with four cases; all have remained free from recurrence.

ADVANTAGES OF THIS OVER OTHER PROCEDURES.

Extraction of the ganglion. Certain theoretical claims were advanced in favor of the operation, and these have been substantiated by our clinical experience.

1. *Control of Hemorrhage.*—It minimizes the amount of hemorrhage. No one can speak the truth and say that hemorrhage is not a troublesome feature. Hemorrhage from the middle meningeal artery is of little or no moment, and it can be controlled easily whether the vessel be injured as it courses along the temporal bone or at the foramen spinosum. On the contrary, hemorrhage from emissary veins is distinctly troublesome. The greater the number and firmness of dural attachments, the greater will be the hemorrhage from this source, and the nearer we approach the ganglion the firmer the adherence and the freer the bleeding. Inasmuch as the ganglion receives its greatest blood supply from below, surgeons are advised to put off elevation of the ganglion to the last. To divide the sensory root the base of the ganglion is left undisturbed and this cause of free and persistent bleeding avoided.

The only other source of hemorrhage worthy of consideration is the cavernous sinus. Injury to this sinus has caused hemorrhage, if not serious and alarming, at least necessitating suspension of the operation for a day or more. This vascular channel being in intimate relation with the internal aspect of the ganglion, is exposed to danger once the operator begins to free it from the ganglion. Confining, as we do in practicing division of the sensory root, our manipulations to the root itself and to the posterior aspect of the ganglion, we work at the point of greatest safety, insofar as the sinus is concerned, and need never give it a thought.

2. *Simple Technic.*—Its execution is comparatively simple. It goes without saying that the exposure of the ganglion is by far less difficult than its extraction. Once the ganglion is exposed, we have made all the preparations necessary for the division of the sensory root; thus this operation is complete before the difficulties common to the extraction of the ganglion have been approached.

3. *Avoidance of Injury to Adjacent Structures.*—The cavernous sinus is not exposed to injury. The abducens is in such intimate relation with the ophthalmic branch that division of one is almost impossible without division of the other. In the extirpation of the ganglion it is a matter of great difficulty to preserve this cranial nerve intact. The motor root is always destroyed in extraction of the ganglion; whereas, in division of the sensory root, the motor root may be preserved intact.

4. *Reduction in the Rate of Mortality.*—If the troublesome difficult features attending operation for the extraction of the ganglion are, to a great extent, eliminated, there should be an appreciable reduction in the time required to complete the operation, and it is only reasonable to predict that the operation, which is more economical as to time and attended with considerably less hemorrhage, will be attended with a lower mortality.

TECHNIC.

This phase of the subject has been treated fully in previous papers.[2] The approach to the ganglion by the usual Hartley-Krause method, the temporary or permanent resection of the zygomatic process, the exposure of the foramina ovale and rotundum as guides to the ganglion; an incision in the dura propria from one foramen to the other; the reflection of dura propria from the superior and posterior aspect of the ganglion revealing the sensory root; picking up of the root on blunt tenaculum and division of same completes the operation.[3]

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Surgery and Anatomy, and approved for publication by the Executive Committee: Drs. DeForest Willard, Charles A. Powers and J. E. Moore.

1. University of Pennsylvania Med. Bul., June, 1903, p. 126.

2. University of Pennsylvania Med. Bul., December, 1901; Philadelphia Med. Jour., Oct. 25, 1902.

3. Considerable importance has been attached to what has been called the intra-arterial route and the difficulties attached to injury to the middle meningeal artery grossly exaggerated. One familiar with the great variation in the course of the middle meningeal artery and its relation to the temporal and frontal bone realizes at once the futility of attempting to establish a point below which one can operate always with the assurance that the vessel will not be injured. The danger of injuring the middle meningeal vessel in opening the skull is due to the fact that the vessel sometimes runs in a bony canal, sometimes in a deep channel. When the fragment of bone is removed the vessel is lacerated. Sometimes there is no canal at all, usually the canal begins sufficiently high to escape injury; exceptionally, however, the canal begins so far down that it would be impossible to make an opening large enough to enable one to carry out the necessary manipulations on the ganglion by the so-called infra-arterial route. Common sense prompts one to make the opening as near the base of the skull as possible, not especially to avoid the artery, but in order to reduce to a minimum the distance from the margin of the skull to the ganglion and to make the opening only as large as the manipulation may require. No other directions to the operator are necessary; he avoids injuring the artery if he can, and if he can not, it is a matter of no difficulty to control the hemorrhage.

DIFFICULTIES ATTENDING THE OPERATION.

An objection has been made to the operation we advise for the relief of tic douloureux, viz., that the sensory root can not always be exposed, and that in such a case resection of this root would be impossible. Dr. Spiller thinks it is extremely probable that resection of the posterior part of the gasserian ganglion would have the same effect as resection of the sensory root. The object we strive for is the division of the central nerve processes which arise in the cells of the gasserian ganglion. Many of the cells that send processes into the sensory root are cut off from this root by a resection of the posterior part of the ganglion, and the effect in the permanent relief from pain would probably be the same as though the sensory root were divided. If, therefore, there is any difficulty in exposing or recognizing the sensory root Spiller recommends a resection of the posterior part of the ganglion, believing that it would be as effective as a resection of the sensory root.

PHYSIOLOGIC EXTIRPATION OF THE GASSERIAN GANGLION.

Up to this time the claims which have been made for division of the sensory root have been based altogether on the results of our own experimental and clinical evidence. It might be well at this juncture to introduce the evidence of an impartial critic whose judgment and opinions in matters pertaining to the physiology, pathology and anatomy of the nervous system are held in great respect. Van Gehuchten has published recently a most instructive and interesting paper on the surgical treatment of trifacial neuralgia,[4] and in this article he discusses somewhat at length the effects of division of the sensory root. Owing to the fact that he believes this operation to be as radical in effect as extirpation of the ganglion, he has styled the former not inappropriately the "physiologic extirpation of the ganglion," and regards it as both less dangerous and more complete than the operation of Krause.

His observations and conclusions on the question of regeneration or degeneration of the sensory root confirm absolutely our own. Every fiber of the central nervous system, he says, attacked by secondary degeneration is a fiber inevitably lost. "The nerve fibers of the central nervous system interrupted at any part never regenerate. The section of the large root of the trigeminal nerve is equivalent, then, at least as regards its effects on the bulbo-spinal root, to the destruction or extirpation of the gasserian ganglion itself. Whether the cause of the trifacial neuralgia resides in the semilunar ganglion, or in one or the other of the three peripheral nerves, at the moment we interrupt completely all communication between the ganglion and cerebrospinal axis, we destroy inevitably the route by which painful impressions are conveyed to consciousness.

"The section of the large root of the trigeminal nerve, even though it does not constitute an anatomic extirpation of the semilunar ganglion, is equivalent, then, to a true physiologic extirpation, and is the only one which is of importance in point of view of treatment of trifacial neuralgia.

"This physiologic extirpation is not only more complete and easier to accomplish than the tearing out of the ganglion recommended by surgeons, but it has an advantage over this mode of operation which is not to be despised. It leaves intact the connections of the ganglion with the peripheral organs."

4. Le Nevraxe, vol. v, and University of Pennsylvania Med. Bul., April, 1904.

That the operation on the root is much more simple than the extirpation of the ganglion might be inferred from the fact that many surgeons, among them Poirier, Horsley and Lauwers, recommend tearing out the root as a preliminary measure to extirpating the ganglion. If the exposure of the root were a matter of any great difficulty, this step of the operation naturally would have been postponed until the last when the ganglion was entirely freed from its attachments.

It has been said that the suggestion made by Dr. Spiller, in 1898, of treating tic douloureux by division of the sensory root was not original; that there was on record one instance in which, prior to 1898, the operator had deliberately torn out the root. This is quite true, but it should be borne in mind that the surgeon did not perform this as an operation of choice, but did it because he was unable to remove the ganglion. His patient died within a few hours, and he never repeated the operation nor recommended it to others. For the conception of the idea that division of the root was equivalent to physiologic extirpation of the ganglion credit is due to Spiller alone. Furthermore, those who have taken exception to the claim of originality ought to have known that there is a very distinct difference between avulsion of and division or resection of the root. Avulsion of the root is not only unnecessary, but what is still more important, may be distinctly harmful. Simple division of the root suffices to cause complete and persistent degeneration of the bulbospinal root of the trigeminal nerve, and the possibility of recurrence of the symptoms is therefore *nil*. Avulsion may expose even the pons to concomitant lesions (Van Gehuchten), and for this reason alone the procedure should be rejected.

AVOIDANCE OF OCULAR DISTURBANCES.

Noteworthy in our experience is the absence of any ocular disturbances. Attention has already been called to the frequency with which the structures on its inner aspect, including the third, fourth and sixth nerves, have been injured in extirpation of the ganglion, and to their escape from injury in division of the sensory root. The most serious ocular disturbances of extirpation of the ganglion is corneal ulceration. Although no especial pains have been taken to guard against it, our cases have been entirely free from this complication. Spiller says it is probable that sympathetic fibers pass to the eye after entering the trigeminal nerve through the gasserian ganglion, and as in division of the sensory root these fibers are not injured, the danger of ocular disturbance by this operation is lessened. The trophic influence of the gasserian ganglion on the eye may possibly depend on the integrity of these sympathetic fibers, but it is probable that these fibers are not so numerous in man as in the lower animals. (The literature bearing on this subject has been carefully studied by Kreuzfuchs.) Of this phase of the subject, Van Gehuchten writes: "The persistence of the anatomic connections between the peripheral organs and the gasserian ganglion, separated from the nervous axis, without doubt, prevents the grave ocular complications mentioned by Kraus and Lauwers." The experimental investigations of Van Gehuchten himself and of Lugaro and Bonne have shown that while degeneration of the fibers of the central stump follows division of the sensory root, the ganglion itself does not undergo any marked modification. This is equally true of the posterior roots of the spinal cord and their ganglia as of the cranial nerves and their ganglia.

V 4
190

METHODS OF ABBE AND VAN GEHUCHTEN.

Recognizing from his wide experience the difficulties and dangers that attend extirpation of the ganglion, Abbe recommended another operative procedure, because it was very much safer and, in his opinion, equally efficacious. This consists in division of the second and third divisions at their exits to their respective foramina and the subdural interposition of tissue. Two objections to this method of treatment at once suggest themselves: The first that the operation is applicable only to those cases in which the pain is distributed only to the second and third divisions; the second that there is a possibility of the rubber tissue acting in the rôle of a foreign body setting up a reaction in the tissues, which would terminate in abscess formation and necessitate the removal of the foreign material.

Abbe says: "It is certainly past dispute that there is no need for the removal of the first branch of the fifth pair in any case of grave tic douloureux unless the origin is to be found in a tumor of the gasserian ganglion or behind it." This may apply to the majority of cases, but it certainly is not a rule without exception. In fact, in two of the four cases which constitute this series, the pain was most intense in the distribution of the first division.

It might also be said of Abbe's operation that it offers no assurance against subsequent involvement of the first division, and so far as the mortality is concerned, it should be no less than that following division of the sensory root, since both are intracranial operations, the only difference being that in one two peripheral branches are divided, while in the other the central root of the ganglion.

Van Gehuchten, in his recent contribution to the treatment of trifacial neuralgia, recommends the tearing out of the peripheral branches, a procedure which, he says, is simpler and much more easily executed than intracranial resection. This recommendation is based on the following phenomena: Simple division of a cranial nerve nearer to or further from the base of the cranium is followed by degeneration of all the cells of origin, but with complete integrity of all or almost all of the fibers of the central end. This degeneration is only temporary, however, and is soon followed by reparation of the nerve and restoration of the function. Tearing out of the nerve, on the other hand, produces reactional phenomena much more intense; the degeneration that follows soon becomes an achromatosis, and this, in turn, is followed by atrophy and disappearance of all the injured cells. These phenomena have been observed only in motor nerves, and to prove whether sensory nerves would be affected in a similar manner, experiments were conducted on rabbits; the three peripheral branches were seized with a hemostatic forceps at their exits from the supraorbital, infraorbital and mental foramina and torn away. The results were positive; not only was there atrophy of the cells of the ganglion, but Wallerian degeneration of its bulbospinal root.

As regards the technic of the operation, the nerve should be freed as far as possible from all its connections and seized as near as possible to the base of the cranium, in order to make the resulting traumatism more intense. In reviewing the literature of the subject, Van Gehuchten found that this operation had been recommended and practiced by Blum in 1881, and later by Doyen. There seems to have been some apprehension on the part of surgeons that there was danger in employing the force necessary to tear the nerve, of inflicting some serious injury to the brain centers. In any other cranial nerve this complication might occur, but the gasserian ganglion is so firmly attached to the base of the skull that this accident could not be considered possible.

These observations of Van Gehuchten are certainly worthy of the surgeon's consideration. If avulsion of the nerve will result in such degenerative changes of the ganglionic cells and the bulbospinal root that restoration of function is impossible, this operation should be practiced as a substitute for the intracranial operations. Whether or no surgeons at large would be willing to practice in those cases in which a so-called central operation is indicated, it should at least be given a trial, when circumstances call for a peripheral operation; that is to say, instead of resecting a portion of the inferior dental or infraorbital nerve, the nerve should be forcibly torn away. If Van Gehuchten's observations are correct, it is reasonable to assume that there would be less chance of recurrence in the case of the latter than of the former operation. Not, of course, until this operative procedure has been proven successful in its application on the human subject can it claim the support of the surgical profession. Therefore, with the exception of a few isolated cases, it is supported only by the results of experimentation on rabbits.[5] Davis, in 1898, operated on a case in which this idea of Van Gehuchten's was put into practice, but with unfavorable results. The superior maxillary nerve was exposed as it ran from the gasserian ganglion. The nerve, as it entered the bone, was grasped with a hemostatic forceps and pulled upward; with another forceps the nerve was grasped closer to the ganglion and twisted loose from it. The relief which followed the operation was only temporary, the pain gradually returned and became so severe as to require a more radical operation. In commenting on the case, Davis says the explanation of the return of pain is left to the experts. The operation was practiced in the manner prescribed by Van Gehuchten; it might be claimed that the twisting out of the nerve was not sufficiently violent or brusque, but this view is hardly acceptable

REMARKS BY DR. SPILLER.[6]

In studies of the nervous system of dogs,[7] in which the sensory root had been cut, I found that when only the external part of this root was divided the degeneration in the spinal root of the trigeminal nerve of the pons and medulla oblongata by the Marchi method was only in the dorsal part of the root. This is well shown by photographs in the article referred to. I believed from these investigations, published in December, 1901, that I was justified in concluding that the fibers of the lateral portion of the sensory root at its entrance into the pons, in their further course, occupy the dorsal part of the descending spinal root. From this it follows that the fibers of the inner portion of the sensory root occupy the ventral portion of the descending spinal root.

The investigations of Van Gehuchten on the changes occurring in the sensory root of the trigeminal nerve, after tearing out peripheral branches of this nerve, are important. He says, in relation to this subject: "This

5. University of Pennsylvania Med. Bull., April, 1904.

6. The following observations on the relative position of the fibers belonging to the three peripheral branches of the trigeminal nerve in the gasserian ganglion and the sensory root and their continuation in the spinal root are by Dr. Spiller, including an explanation for the limited area of anesthesia of the face occurring after partial division of the sensory root.

7. Spiller and Frazier: University of Pennsylvania Med. Bul., December, 1901.

degeneration of the fibers of the bulbospinal root, after a tearing out of the peripheral nerves, is so constant that we have encouraged one of our students, Dr. Bochenek, to employ this method in determining the situations in the bulbospinal root of the fibers belonging to each of the three branches. The results of his investigations have shown that after a tearing out of the frontal nerve the degeneration is localized exclusively to the ventral portion of the bulbospinal root; after a tearing out of the mental nerve, it occupies the dorsal portion of the same root. The tearing out of the infraorbital nerve is followed by a degeneration of a certain number of fibers in the middle region.

"Our own recent investigations are in support of these findings. They show, further, that the number of fibers in degeneration of the bulbospinal root is in direct relation to the number of peripheral fibers that have been ruptured. Bochenek, in his investigations, was content to tear out only one of the branches of the ophthalmic nerve of Willis, the frontal nerve; he obtained distinct

Fig. 1.—Showing the area of anesthesia one week and thirty-two months after division of the sensory root.

degeneration involving a small number of nerve fibers at the ventral extremity of the bulbospinal root. In our own investigations we have torn out the three branches of the ophthalmic nerve, emptying completely the orbital cavity. After a survival of forty-five days we have obtained a much more extensive degeneration of the ventral portion of the bulbospinal root.

"This degeneration of the fibers of the bulbospinal root can be understood, in our opinion, only by admitting that rapid atrophy occurs in a certain number of cells in the semilunar ganglion, an atrophy following the tearing out of the peripheral branch. We desired to determine the existence of this atrophy by the examination of the gasserian ganglion, but our investigations have not been successful. After the tearing out of one or the other of the three branches of the trigeminal nerve, chromolysis of the cells in the ganglion is found after about ten days, but if the animal is allowed to live fifty or sixty or eighty days it is impossible to determine whether the number of nerve cells has diminished in the ganglion on the operated side, even after a tearing out of all three nerves, frontal, infraorbital and mental. These results should cause no surprise; the gasserian ganglion is difficult to remove; it has, further, a very complex structure; its constituent cells, instead of being placed one close against the other, are usually situated in long bands, like islands, between the fasciculi of nerve fibers, which they accompany in a certain part of the nerve. It is, furthermore, very difficult, if not impossible, to make comparable serial sections of the two semilunar ganglia of the same animal.

"Having in mind the Wallerian degeneration of the fibers of the bulbospinal root after a tearing out of the branches of the trigeminal nerve, and the cellular phenomena which occur in the cells of origin of the peripheral nerves after the tearing out, we believe that we may conclude that the tearing out of one or the other branches of the trigeminal nerve is followed by rapid atrophy of the corresponding cells of the gasserian ganglion, an atrophy which causes in its turn Wallerian degeneration of the central fibers. It is, therefore, proper to propose the tearing out of the nerve as a rational surgical treatment of trifacial neuralgia."[8]

Comparing Van Gehuchten's results with those obtained by me, it will be seen that the fibers of the ophthalmic nerve are represented in the ventral portion of the descending spinal root of the trigeminal nerve (Bochenek, Van Gehuchten), and that the fibers of the inner portion of the extrapontile sensory root are represented in the ventral portion of the descending sensory root (Spiller); therefore, these fibers do not mix with those belonging to the other peripheral branches of the trigeminal nerve; likewise that the fibers of the third division are represented in the dorsal part of the descending spinal root (Bochenek, Van Gehuchten), and that the fibers of the external portion of the extrapontile sensory root are represented in the dorsal portion of the descending spinal root (Spiller), and, therefore, these fibers do not mix with those belonging to the other peripheral divisions of the trigeminal nerve.

This is an important conclusion, because if only the outer portion of the sensory root of the trigeminal nerve is cut loss of sensation should be expected only in the third division of the nerve, and we may conclude when loss of sensation is found also in the distribution of the second division that at least half the sensory root is cut through. This explains why sensation of the face is only partially lost when only a portion of the sensory root is cut, and in such cases it will probably be found that the anesthesia is in the third division of the trigeminal nerve, because the external fibers of the sensory root are more likely to be divided than the inner.

Recent anatomic studies in the territory innervated by the sensory root of the trigeminal nerve, show that this territory is less extensive than formerly supposed. The sensory area of the trigeminal nerve as shown by Otto Grosser does not extend to the chin.[8] In the diagram of Frohse, the cervical nerves supply the sensation to a considerable area of the face above the chin. According to Zander, the area of the cervical nerves extends almost to the corner of the mouth, and is only about a finger-breadth from the bony orbital border. It is very important that these facts should be borne in mind when the extent of the anesthetic area caused by resection of the sensory root is tested.

8. Grosser: Centralblatt für die Grenzgebiete der Medizin u. Chirurgie, Feb. 28, 1904.

SYMPATHETIC FIBERS IN THE GANGLION OF GASSER.

The effect on the sympathetic fibers of the eye from operations on the trigeminus is worthy of attention. Kreuzfuchs has collected considerable proof of the existence of sympathetic fibers in this nerve.

Budge cut the trigeminus in animals, in some cases through the trunk, in others peripherally to the ganglion, and found that after either operation contraction of the pupil occurred. After central division of the fifth nerve the pupil did not contract so greatly nor persistently as after peripheral division of the nerve. Budge assumed that the trigeminus receives in the gasserian ganglion those sympathetic fibers which innervate the dilator pupillæ, and this opinion has been held by all subsequent investigators who have studied the motor tract for the dilatation of the pupil. These fibers pass from the gasserian ganglion to the eye through the first division of the trigeminus, and therefore contraction of the pupil occurs after division of the trigeminus.

Schiff also found that dividing the trigeminus causes contraction of the pupil, and that there is a difference when the division is made behind or in front of the gasserian ganglion.

Claud Bernard found that the pupil contracts after division of the trigeminus and after a certain time dilates but never attains the same size as the pupil on the other side. These phenomena occur after central as well as after peripheral division of the fifth nerve, but these changes are much more striking and are associated with disease of the cornea when the division is peripheral.

Balogh concluded that all pupillary dilator fibers pass through the gasserian ganglion and the first division of the trigeminus.

Similar opinions were held by Oehl and Gutmann, although the latter believed that no pupillary dilator fibers arise in the medulla oblongata, as Balogh had assumed, and that the division of the trigeminus stem has no effect on the pupil. This view has been shown to be incorrect by Claud Bernard and by Kreuzfuchs.

Budge having believed that the trigeminus contains motor dilator fibers, later investigators have tried to determine whether these fibers are a part of this nerve or merely received from the sympathetic. From the investigations of Schpilow and Braunstein, it seems to be decided, at least for many animals, that the trigeminus receives the dilator fibers of the pupil through the gasserian ganglion.

Kreuzfuchs has cut the trigeminus in rabbits [illegible] the base of the brain. The pupil was smaller immediately after the operation than it was later. In these animals exposure and irritation of the cervical sympathetic on the operated side caused maximal dilatation of the pupil on the same side, so that the dilator fibers could not have been cut.

Examination of cases in which the gasserian ganglion has been removed in man seems to show that removal of this ganglion does not cause contraction of the pupil, so that Kreuzfuchs doubts whether what is true of the lower animals is true also of man, viz., that all dilator fibers of the pupils pass through the gasserian ganglion, and he is inclined to accept the view that in man the dilator fibers act through the abducens. He says, however, that after removal of the gasserian ganglion in man, the pupils are of equal size in the light, but in shadow the pupil on the unoperated side is larger.[9]

It seems probable from these observations that even in man a certain number of sympathetic fibers enter the gasserian ganglion, but in a case of division of the sensory root reported in 1901 by Dr. Frazier and myself no difference in the size of the pupils in shadow can now (May 21, 1904) be determined. After several years a readjustment of the pupillary mechanism is to be expected.

RESUME OF FOUR CASES.

CASE 1.—J. L., age 68. Duration of affection, five years. Previous treatment, four peripheral operations. The first division alone was involved.

Operation.—October 12, 1901. Two years and eight months ago.

Result.—No recurrence.

CASE 2.—S. R., age 79. Duration of affection, three years. Preliminary treatment, course of hypodermic injections of strychnia with only temporary relief. Third and second divisions involved in the order named.

Operation.—October 21, 1902. One year seven and one-half months ago.

Result.—No recurrence.

CASE 3.—A. W., age 54. Duration of affection, nine years. Treatment, nil. Second and third divisions involved in the order named.

Operation.—March 31, 1903. One year and two months ago.

Result.—No recurrence.

CASE 4.—F. S., aged 54. Duration of affection, 14 months. Previous treatment, nil. First and second divisions involved.

Operation.—March 17, 1904.

Result.—No recurrence.

OSMIC ACID INJECTIONS FOR RELIEF OF TRIFACIAL NEURALGIA.*

JOHN B. MURPHY, A.M., M.D.
CHICAGO.

The publication of Delbastaille's[1] article on the injection of osmic acid in inoperable tumors and its subsequent use in the same direction by von Winiwarter[2] and others, attracted much attention, but the results were unfavorable and its use was abandoned. During this experimentation Neuber reasoned that, as osmic acid has a special affinity for the medulla of peripheral nerves as a stain, it might prove beneficial in a clinical way. At this juncture a patient presented himself who had been suffering from neuralgia of the first and second branches for six years on whom, Aug. 15, 1880, a resection of the second division by Professor Albert, on the plan of Lücke, von Bruns and Lassen, had been made. The patient experienced relief for one year, then had several relapses. On Nov. 30, 1882, there was a ligation of the carotid, with no relief. From Jan. 18 to Feb. 9, 1883, daily injections of 4 to 6 drops of a 1 per cent. solution of osmic acid in water were given, inserting the fluid near the infraorbital foramen, angle of the nose and in the lower lip. The relief was only short lived and by the middle of June the pain returned. A second similarly treated case was well at the end of three months. A third case of sciatica had the injections over the sciatic nerve at the site of pain. The patient remained well up to the time of publication of this article.

9. Kreuzfuchs: Oberstelner's Arbeiten, vol. x, p. 275.

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Surgery and Anatomy, and approved for publication by the Executive Committee: Drs. DeForest Willard, Charles A. Powers and J. E. Moore.

1. Centralblatt für Chirurgie, 1882, No. 48.

2. Mittheilungen aus der Chirurgische Klinik zu Tübingen, 1883, p. 213.

The local reaction was very slight, with no necrosis of tissue and little swelling or edema; no paralysis. (It will be noted here that the injection was not made into the nerve trunk, but around it, nor was the acid injected into the foramina.)

The toxicity of osmic acid as shown by Naunyn, Gmelin, Husemann and Brauell is mild, and only in doses of 2 grams or more, administered by the stomach, does it prove fatal to animals. But one fatal case in man was reported by Raymond, the dose not given. It is safe to say that administered hypodermically it is free from constitutional reaction.

Osmic acid injections for peripheral neuralgia, says Joseph Lipburger,[3] were first recommended by Neuber of Kiel. Osmic acid was used by Nicoladoni in a case of trifacial neuralgia of nine years' standing, originating in the supraorbital nerve, which was resected, and the pain then appeared in the infraorbital and mandibular branches. These were each resected in succession and it then recurred in the supraorbital, six years after the first resection. Sensation had returned in the whole face, notwithstanding the resection of all the facial nerve branches and the mandibular, even up to the angle of the jaw; though it was not perfect compared with the opposite side, it was practically restored. Patient, October 16-22, received six injections of 7½ m. of a 1 per cent. solution into the supraorbital area. There was some gangrene after the second series of six injections of 2 cm. of a 1 per cent. solution. This was slow to heal and left a dark scar. The gangrene is attributed by Lipburger to the excessive quantity used so close to the skin. (In this view I concur; while I have had no such result following any of my cases, there is a deep necrosis of the area around the point of injection.) The pain in this case was absent for a year after the injection was made. There was no incision made in Neuber's or Nicoladoni's cases, and no effort was made to inject the solution into the nerve substance, as was done by Mr. Bennett. The effect was supposed to be exerted on the peripheral nerves and not on the trunks. It was cheerfully commended by Leipsiger, but dropped out of general observation until restored by Bennett.

Jacobi[4] treated 18 cases of neuralgia with subcutaneous injections of 1 per cent. osmic acid, giving one-half to one syringeful; of these, 8 cases, among which were 5 sciaticas, were cured; 2 improved, and 8 not cured. It is most efficacious in inveterate sciaticas. Application is not without danger. Radial paralysis followed an injection into the arm.

J. Mercer[5] reports favorable results from deep injections of 1 per cent. osmic acid in sciatica. Relief following one to four injections between the tuber ischii and the trochanter major was temporary, though in the later cases there was greater relief than after morphin injections. Twelve injections were made in one case.

B. M. Schapiro[6] treated 8 cases of trigeminal neuralgia with subcutaneous injections of osmic acid (3 males and 5 females). Two males and 3 females were cured; 2 improved, 1 unimproved. He recommends osmic acid, 0.1, water 6.0, glycerin 4.0. About twelve injections. Bad results occurred only once in an epileptic woman. He believes the result to be due to corrosion (aetzung) of the terminal branches. Even though there are no cures and recurrences take place, the method is to be warmly recommended.

W. H. Bennett[7] treated 12 cases of neuralgia with injections of 10 to 15 m. of 1 per cent. solution of osmic acid. Ten cases were trigeminal, several of them with very severe symptoms (tic). One case an amputated stump in which the popliteal and peroneal nerves were injected. In one case where the median nerve was injured and thickened with paralysis of long standing, the injection was made below the point of thickening; results were favorable in all cases. Bennett laid the nerves bare by a short incision and injected 10 to 15 m. of the solution into the nerve trunk, changing the position of the needle three times. The cases were all obstinate. Symptoms were alleviated in a few hours and disappeared within a few days. There were slight recurrences in 2 cases—one in a different area, e. g., that supplied by the auriculotemporal branch when the original pain was in the infraorbital. Bennett operated on his first case in May, 1897. He believes the method ought to be applied early.

PATHOLOGY OF TRIFACIAL NEURALGIA.

The changes described by pathologists who have had opportunities to examine avulsed ganglia from operations, or to make postmortem examinations of the ganglia of trifacial neuralgia cases, are almost as varied and diverse as the number of investigators. Hence it would be fair to say that there is no definite well-defined pathologic lesion that is found with anything like uniformity. However, this does not detract from our interest in the pathologic findings reported by different investigators. There is also a great divergence of opinion as to nerve changes proximal to division of the sensitive fibers or of the posterior roots of the spinal nerves, as well as the regeneration and degeneration of the trifacial.

G. Marenghi[8] made 127 experiments on animals, using the sciatic nerve. He believes the following conclusions are established:

1. Electric inexcitability in the scar; 2, impossibility of transmitting electric excitation through the scar; 3, excitability of the central stump; 4, excitability of the peripheral stump above the scar.

The re-establishment of motor function is not indissolubly connected with regeneration of nerve fibers, but that function in a given territory may be re-established by collateral nervous paths, e g., the crural after-division of the sciatic.

Keen and Spiller[9] remark that in six of their seven cases the lesions were intense in degree and unquestionable. In the ganglia the medullary sheaths and axis cylinders were much swollen, the fibers atrophied, the sheaths empty, with nerve bundles in which the nerve elements had been destroyed and only connective tissue was left. The ganglion cells were atrophied and stained faintly; the blood vessels were sclerosed and even in some cases without a lumen.

Garré,[10] in writing on nerve regeneration after extirpation of the gasserian ganglion, and the cause of the return of trifacial neuralgia, says the majority of trigeminal neuralgias are located in the peripheral nerves, therefore, recurrences after resection are not surprising and are due to this regeneration. In one of Garré's cases, in spite of resection of the gasserian ganglion, the

3. Centralblatt für die Gesammte Therapie, 1884, Nicoladoni's Klinik.
4. Transactions of the American Neurological Association, 1885, p. 11.
5. The Lancet, 1885.
6. Die Behandlung von Neuralgien mit Injectionem von osmium Säure, St. Petersburger med. Woch., 1885, No. 26.
7. The Lancet, Nov. 4, 1899.
8. Archivo Ital. de Biol., 1898.
9. American Journal of the Medical Sciences, November, 1898.
10. Archiv für Chirurgie, 1889, vol. iix, p. 390.

second and third branches of the trigeminus were regenerated, the former twice. He offers as explanation of the recurrences:

1. Hysteria. (I do not consider this of any value; merely another expression for an absence of definite knowledge.)
2. Seat of neuralgia in the brain center.
3. Regeneration of nerves through anastomosis or imperfect resection of the ganglia.

T. C. Renton[12] reports examination of two ganglia in which there was absolutely no abnormality.

Schäfer[13] states Van Gehuchten and Nélis observed that sensory nerve cells of the vagus ganglion disappeared after cutting fibers. If this were true of other sensory nerves it would be difficult to see how they could ever regenerate. Restoration of function would have to be explained by ingrowth of sensory fibers from other areas of distribution. Other observers have not confirmed

Fig. 1.—Shows the supraorbital in two divisions: the infraorbital; the submaxillary or mandibular and the lingual branches. (From Toldt.)

In his cases cited above there was no question as to complete removal of the ganglia.

L. F. Barker[11] examined two cases, using Nissl's method. There were scarcely any normal appearing cells; in some there was an absence of tigroid bodies. Some of the nuclei were swollen; there was no typical Marchi degeneration, no pigmentary changes in cells, no vascular changes and no interstitial hypertrophy. Concentric bodies were present.

these statements as far as the spinal root ganglia are concerned.

Sidney I. Schwab[14] collected 20 cases from the literature in which ganglia were examined after removal. Few of these cases will stand criticism. He also examined two cases, in one of which the nerves had been resected ten years previously. In both cases the nerve cells must be regarded as pathologically altered,

11. The Journal A. M. A., May 5, 1900.

12. British Medical Journal, Nov. 17, 1900.
13. Text-book of Physiology, London, 1900.
14. Annals of Surgery, vol. xxxiii, 1901.

but in neither to such an extent as to consider them permanently affected. The definite changes usually found in acute or long-standing parenchymatous nerve cell affections are absent. The more marked changes in one of the cases lose significance from the fact that the nerves were previously resected. Neuritis and atrophy were probably present. The concentric bodies of brain sand found in one case and which have been described by Barker and Spiller are probably corpora amylacea. Their pathologic significance is probably *nil*. He concludes that trigeminal neuralgia has no definite pathologic entity. That it is:

1. A neuritis beginning in the terminal divisions of the fifth nerve, and having a tendency to ascend to the ganglia.

2. An interstitial inflammation, chronic and progressive, of the ganglion itself.

3. Central neuralgia or neuritis, affecting the sensory root as it leaves the pons.

He believes also that wherever the process is located, removal of the ganglion must be the first means of relief.

Krause in his report (Die Neuralgie des Trigeminus), of the study of four cases of trigeminal neuralgia, remarks that the ganglion cells showed pigmentation, vacuolization and atrophic appearances. There were no changes in the blood vessels and no interstitial neuritis. He believes that the changes are, first, parenchymatous in nature, and, second, that the myelinized nerves are involved later.

P. L. Friedrich[15] reports a case of recurrence on both sides after complete successful exsection of the ganglion on one side. He explains this—according to Garré's hypothesis—that by means of nerve regeneration and collateral nerve branches the sensory trigeminus center is certainly brought into communication with the periphery. (This, we believe from our observations, comes nearer to the true explanation of the recurrences of trifacial neuralgia.)

Fig. 2.—Shows the ganglia and the relations of the branches at the exit from cranium, as well as the glandular divisions. (From Toldt.)

W. G. Spiller and C. H. Frazier[16] report the division of the sensory root of the trigeminus for the relief of tic douloureux. The sensory roots of the trigeminus were resected in dogs. Experiments were not conclusive, but

15. Deut. Zeitschrift für Chirurgie, vol. lii, p. 360.
16. Univ. of Penn. Medical Bulletin, December, 1901.

V 4
190

rather contradicted regeneration. A canvass of the literature convinced them that regeneration had not been established in man and that no recurrence of its function was known after resection of the sensory root.

They again report[17] the division of three posterior roots in dogs. The animals were killed at the end of ten months. There was absolutely no trace of regenerated nerve fibers in the cord. The intramedullary portion of the roots was completely degenerated.

Spiller and Frazier[18] further report on the treatment of tic douloureux by division of the sensory root of the gasserian ganglion. The rationale of the operation depends on the inability of this root to undergo regeneration. They proved that only those nerve fibers provided with sheaths of Schwann have the possibility of regeneration. This was confirmed by Ballance and Stewart.[19] Therefore, regeneration of peripheral nerves is common, while regeneration of the nerve fibers of the central nervous system is rare, if it occurs at all. This leads to revival of the old theory of peripheral regeneration.

After resection of the sensory root, if nerve fibers have grown out from the sheath of Schwann, they can only go as far as this sheath is present, i. e., to the point of entrance of the sensory root into the pons. They report one successful case with complete anesthesia at the end of one year.

The findings reported by Spiller and Frazier from the division of the posterior roots in dogs do not correspond with those obtained by Y. Bikeles in the Physiologic Institute of Prof. A. Beck[20] in Lemberg. This author showed by experiments that after compressing the posterior roots there are slight attempts at regeneration, contrary to the theory advanced that there is no intramedullary regeneration.

No positive evidence has been obtained to show that regeneration of nerve fibers takes place within the nerve centers after artificially produced lesions. It is remarkable, however, that outside of the nerve centers or ganglia the nerves are regenerated and that the regenerated fibers find their way along the old nerve sheaths to the same structures to which they were distributed before section or degeneration occurred. Regeneration on the distal side of division of a nerve cylinder is readily understood, as the cylinder is merely an extension of the cell from its nucleus, and cell portions do not long survive when they are disconnected from their nucleus. It is well recognized that distal degeneration takes place early in motor fibers after division, and that proximal degeneration advances slowly, probably from non-use, as after amputation. This may account for the absence of degeneration in specimens obtained in our first experiments, as the time was so short, but the paralysis was complete and continuous. The portion of the nerve cut off from the central cell nucleus always undergoes degeneration. Even after division ascending degeneration is limited to a small distance; after division of a sensi-

Fig. 3.—Shows the posterior palatine, the posterior palatine foramen and the mandibular branch. (From Toldt.)

17. Univ. of Penn. Medical Bulletin, 1902.
18. Philadelphia Medical Journal, October, 1902.
19. The Healing of Nerves, Macmillan & Co., 1901.
20. Neurologisches Centralblatt, 1903.

tive nerve, chromatolysis can not be attributed to loss of function or action. It has not yet been satisfactorily explained why, after complete division, some nerves are rapidly (by primary adhesion) restored to function; others by secondary regeneration are restored; while still others, either after division and after reapproximation (either immediate or remote), or after "pressure paralysis" without division, never regain function, still these facts exist clinically, and we must accept them in our empirical treatment of diseased, divided and contused nerves, as well as to hope that chemical substances may permanently interrupt conduction from the periphery to the center, and *vice versa*. It is on this clinical basis that we are justified in hoping the trunk injections may produce more lasting inability of transmission of impulse than neurotomy or neurectomy. From Goltz's experiments it is fair to assume that bodily pain can be of central nerve origin, and this is supported by irritative lesions of the thalamus (Schäfer).

Last year[21] I made a preliminary report of a case operated on June 8, 1903, with the technic, which has been

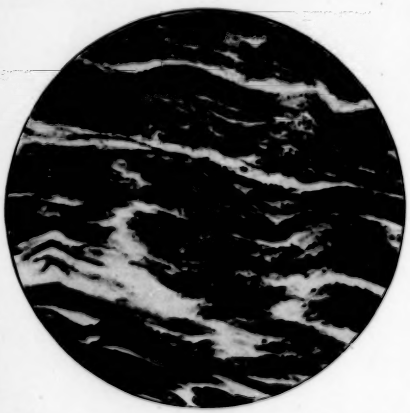


Fig. 4.—Shows a section of the nerve trunk with osmic acid discoloration and granulation condition of axis cylinder.

followed, practically the same, in all subsequent cases, except that I am using a 2 per cent. solution of osmic acid, where formerly I used a 1½ per cent. solution. The case reported at that time has continued free from pain up to date. In that communication I have the results of Sir William Bennett's cases as published in the London *Lancet*, Nov. 4, 1899. I have now the pleasure of reporting his more extended experience with results down to Jan. 22, 1904, as given in a personal letter, for which I express my sincere appreciation. It is as follows:

Results of first 20 consecutive cases operated on.

First case treated July, 1897:

2 patients remained altogether well at the end of 4 years.
2 patients remained altogether well at the end of 3 years.
3 patients remained altogether well at the end of 2 years.
2 patients remained altogether well at the end of 1 year.

Two cases may be regarded as failures, i. e., the relief was only temporary (3 months and six months.) Two patients died without recurrence (1 in 9 months and 1 in 6 months) from causes unconnected with the condition for which the treatment was adopted. Six were lost sight of within 9 months after the operation.

In the other cases operated on, the time which has elapsed since the treatment is not sufficient to justify any conclusion.

In 3 of the successful cases recurrence of pain occurred: 1 at the end of 6 months; 1 at the end of 8 months; 1 at the end of 12 months.

The symptoms subsided in one of these cases after a second injection, and no further trouble had arisen when the patient was last heard from.

EXPERIMENTS.

In order to determine, if possible, the *modus operandi* of cure, I have made the following experiments:

Dog No. 35.—Large size, male. Operated on Aug. 14, 1903. Osmic acid solution 1.5 per cent., freshly prepared, injected into trunks of both brachial plexuses; 3 nerve trunks were injected on each side and both supraorbital nerves. Incisions closed with subcutaneous catgut sutures.

August 18.—Extensor muscles of both fore-legs paralyzed. Dog walks with paws doubled under legs. Paralysis appeared on second day and was complete on the third.

August 25.—Paralysis continues as on 18th.

September 11, 1903.—Paralysis has continued. Anterior surfaces of fore feet ulcerated from pressure of the flexed paws in attempt to walk. Dog killed with chloroform, and specimens from supraorbital nerves and brachial plexuses secured for microscopic examination. No gross changes except at points of injection, where tissues were blackened.

Dog. No. 37.—Small, male. Operated on Aug. 14, 1903. Osmic acid injections in trunks of both brachial plexuses, 3 on right side and 2 on left, and in right supraorbital nerve. Incisions closed with subcutaneous and over-and-over catgut sutures.

August 18.—Right foreleg paralyzed in extensor muscles as in dog No. 35. Left not paralyzed.

August 25.—Condition same as on 18th. Right axillary wound open and granulating, but clean. Paralysis same.

Sept. 11, 1903.—Paralysis has continued. Ulcerations on anterior surface of fore feet (larger on right) from walking with paws flexed. Left cornea opaque with whitish secretion. Nutrition poor. Dog killed with chloroform. Brachial plexuses dissected to cord and specimens taken from following situations for microscopic examination: 1, at site of injection; 2, proximal to injection; 3, anterior nerve roots and posterior roots with ganglia; 4, sections of cord at levels of these roots. Both supraorbital nerves dissected out and following specimens taken: 1, at site of injection; 2, proximal to injection; 3, gasserian ganglia; 4, sections of pons and medulla with sensory roots and nuclei. Specimens put in Mueller's fluid. No gross lesions except at points of injection, where nerves were blackened.

The microscopic findings on the slides made from the injected nerves as given by Prof. F. R. Zeit and Dr. A. A. Goldsmith of the Pathologic Department of the Northwestern University and concurred in by Professor Hill are as follows:

Stains were made both by the Weigert-Pal, and also by the usual hematoxylin and eosin method. All the tissues were fixed in Mueller-formalin. The Marchi method was not used in these specimens to show the degeneration of the nuclein sheath, but was used in the experiments conducted for me by Dr. Dunn.

Dog No. 35.—Anterior roots and posterior ganglia of roots of left side, normal. Injected trunks of right plexus. Many of the medullary sheaths of the nerve fibers stained brownish black by the osmic acid. Anterior roots and posterior ganglia of left side normal. Injected trunks of left plexus. Many of the medullary sheaths of the nerve fibers stained brownish-black with the osmic acid. Anterior root and posterior ganglion of right side, normal. Injected part of the right supraorbital nerve. Some of the medullary sheaths of the nerves are stained brownish-black by the osmic acid. Injected part of left supraorbital nerve, practically the same as right. Ophthalmic division of the 5th nerve proximal to injected supraorbital nerve of left side, normal. Gasserian ganglion and ophthalmic

21. THE JOURNAL A. M. A., Aug. 22, 1903.

division of the fifth nerve (left), normal. Gasserian ganglion and part of sensory root (right), normal.

Dog No. 37.—Right gasserian ganglion, normal. Ophthalmic division of the 5th nerve and gasserian ganglion not injected (left), normal. Pons and medulla with sensory root of 5th nerve, normal. Injected trunk of brachial plexus (right). Many of the nerve fibers show their medullary sheaths stained brownish-black with osmic acid. Trunks proximal to injection in brachial plexus (right), normal. Cord at level of brachial plexus, normal. Trunks on proximal side of injection in brachial plexus (left), normal. Anterior roots and posterior ganglia of brachial plexus (right), normal. Injected trunks of left brachial plexus. The medullary sheaths of many nerve fibers show a brownish-black stain from the osmic acid. Anterior roots and posterior ganglia of trunks of left brachial plexus, normal.

While the motor nerves were paralyzed by the injection, the microscopic report does not show that there was an ascending or descending degeneration or any change other than the local ones at the site of the injections in the nerve. This is not sufficient to account for the clinical phenomena as obtained in our cases, nor is it what should be found after a chemical destruction of a motor or combined nerve. Still the fact remains that there was complete paralysis of the motor nerve and some trophic changes as well. It shows that we are not permitted to use the osmic acid injections in neuralgias affecting the motor nerves.

Additional experimental injections were made under my direction by Dr. A. D. Dunn on four dogs to determine through a second source the pathologic changes produced by the injection of osmic acid into the nerve trunks, and to check the former experimental results.

Dog No. 1.—Injected March 3, 1904. About 15 m. of a 1½ per cent. aqueous solution of osmic acid were injected into each of the supraorbitals, and the cords of the brachial plexus. The supraorbital incisions were closed with horsehair. The axillary incision was closed with catgut and silkworm gut. The connective tissue sheath enclosing cords of brachial plexus and great vessels was reunited with catgut.

Complete paralysis of right upper extremity occurred immediately following injection and persisted until the dog was killed on the 13th day. The right supraorbital incision healed by primary intention, the left with a slight amount of suppuration. The dog gnawed the stitches of the axillary wound, which broke open and suppurated freely.

Necropsy, March 17, 1904.—Right supraorbital incision clean, an indurated lump to be felt beneath it. The supraorbital nerve is buried in a mass of blackened tissue. The nerve for about 1½ inches is blackened, smaller in caliber and more or less adherent to surrounding tissues. No suppuration. Macroscopically, no change could be observed distally or proximally to point of injection. Left supraorbital, some suppuration from wound. There is a more extensive mass of inflammatory tissue. The nerve when dissected out appeared similar to the right. Brachial, large suppurating subcutaneous pocket. Considerable inflammatory deposit. After sheath, which had been reformed by suturing fascia over nerves, was dissected off, the nerves were readily obtained. The inflammatory process seemed to have affected them little. The nerves were completely blackened for a distance of 1¼ to 1½ inches. Distally the diameter of the nerve seemed diminished. Proximally no changes were apparent. The gasserian and cervical spinal ganglia with corresponding part of cord were removed. No gross changes were noted.

Dog No. 2.—Small puppy. Injected March 12, 1904. About 15 m. of a 1½ per. cent. aqueous solution of osmic acid were injected into each of the cords of the right brachial plexus and the right supraorbital. The nerves were small and the injections made with difficulty. The wounds were closed with silkworm gut and with catgut to unite fascia to form sheath over brachial plexus. Complete paralysis of right anterior extremity followed and persisted up to necropsy. The wounds healed by primary intention.

Necropsy, March 26, 1904.—Induration present under right supraorbital, the injected nerve was dissected out of a mass of recent inflammatory tissue; no pus. The nerve was very small and blackened for about 1¼ inches. There was considerable blackening of the adjacent tissues. Distally to, and at the point of injection, the caliber of nerve seemed diminished. The left supraorbital was removed as a control. Axillary wound healed; a considerable amount of inflammatory tissue lay about sheath of great vessels and nerves, and in the paraneurotic tissues. The cords were blackened for 1½ inches with some diminution in their caliber at and distal to point of the injection. No gross changes in cervical cord and ganglia or in gasserian ganglia.

Dog No. 3.—Small puppy. Injected March 12, 1904. About 15 m. of a 1½ per cent. aqueous solution of osmic acid were injected into each of the supraorbitals, and into each of the cords of the right brachial plexus. The nerves were small and the injections were made with difficulty. Much of the osmic acid escaped into the surrounding cellular tissues. The supraorbital incisions were closed with silkworm gut. The fascia over great vessels and brachial plexus was carefully reunited with catgut; the skin incision closed with silkworm gut.

Complete paralysis of the right foreleg occurred immediately following the injection and persisted until death on the 16th day. There was a small amount of suppuration of right supraorbital wound. The other wounds appeared to have healed by primary intention.

Necropsy, March 26, 1904.—Induration present beneath both supraorbital wounds. Suppuration from right; stitches in situ. Inflammatory masses on both sides, but greater on the right. The tissues about nerves were much blackened. The nerves were dissected out with considerable difficulty. The nerve trunks were blackened for about 1¼ inches. No changes distally. The caliber of the nerve was only slightly diminished at the point of injection. Axillary wound healed. Stitches in situ. After opening wound, a small pocket of pus was discovered. Amount of inflammatory reaction greater than usual, but the nerves were easily freed. They were blackened for a distance of about 1½ inches. No diminution in the diameter of trunks. No gross changes in gasserian ganglia, in cervical ganglia, or in cervical cord.

This dog was also a small puppy. Consequently injections were made with considerable difficulty and did not prove as satisfactory as on the first dog, which was very large and whose nerves were large, so that the osmic acid was easily retained within the sheath.

Dog No. 4.—Injected March 30, 1904.—The supraorbitals and cords of the brachial plexus were each injected with about 15 m. of a 1½ per cent. solution of osmic acid in water. The nerves were laid bare and their trunks injected under aseptic precautions. The incisions were closed with silkworm gut suture. The fascia in the axilla was brought together with catgut. The wounds healed by primary intention. There was an immediate partial paralysis of the upper extremity on the injected side. This rapidly disappeared so that there was little residual paralysis at the end of two weeks.

Necropsy, April 14, 1904.—Supraorbital nerves are buried in a mass of inflammatory tissue. The nerve trunks are completely blackened for about 1½ inches. No changes are apparent proximal or distal to the point of injection. No suppuration in axillary wound. There is a considerable amount of inflammatory tissue. Some of the trunks are blackened only superficially. The osmic acid has apparently not penetrated well. A trunk was selected in which the penetration seems to have been good. There are no gross changes in the ganglia or cord.

The following pieces were taken for microscopic examination. At, distal to, and proximal to the point of injection, the gasserian ganglia, cervical ganglia, and parts of cervical cord.

This case differed from the others in not showing any of the slight changes that were present in the ganglia. There

was little or no diffusion of the Nissl bodies, and the nuclei were for the most part located centrally.

It may be noted in these experiments that about 15 m. of a 1½ per cent. aqueous solution of osmic acid were injected into each nerve trunk, under aseptic precautions. The supraorbitals and cords of the brachial plexus were selected for this purpose. The nerves were subjected to as little trauma as possible, and the injections were made slowly. The fascia was always reunited over the cords of the brachial plexus with catgut, and the skin wound closed with horsehair or silkworm gut.

The wounds usually healed by primary intention. Complete paralysis of the leg in which the brachial plexus had been injected, occurred immediately and persisted until death. The dogs were killed about the 13th day after the injection. There was a considerable amount of inflammatory reaction in the tissue surrounding the nerve. The supraorbital nerves were embedded in a blackened inflammatory mass from which they had to be dissected with care. There was a considerable amount of inflammatory reaction about the cords of the brachial plexus, but the cords themselves lay comparatively free in the reformed connective tissue sheath. The nerve trunks were more or less blackened for a distance of 1 to 2 inches. In several instances the size was slightly diminished at, and distal to the point of injection. No gross changes were observed in the proximal portions of the nerve trunks, in the ganglia or in the cervical cord.

MICROSCOPIC FINDINGS IN INJECTED NERVE TISSUE AT, DISTAL, AND PROXIMAL TO THE POINT OF INJECTION, AND IN GANGLIA.

Dog No. I.—Ganglia overheated; Nissl's stain was unsatisfactory.

	Right Supraorbital				Left Supraorbital				Cord of Brachial Plexus			
	At	Distal	Proximal	*Ganglia	At	Distal	Proximal	Ganglia	At	Distal	Proximal	Ganglia
Diminution in caliber	Slight..	.....	.....	.....	?	.....	.....	.....	+	?	.....	.....
Focal necrosis	Slight..	.....	.....	.....	Slight..	.....	.....	.....	Slight..	.....	.....	.....
Round cell infiltration	Slight..	.....	.....	.....	Slight..	.....	.....	.....	+	.....	.....	.....
Polymorphonuclear leucocytes	Few...	.....	.....	.....	Few...	.....	.....	.....	Few...	.....	.....	.....
Derangement of nerve fibers	+ +	.....	.....	.....	+ +	.....	.....	.....	+	.....	.....	.....
Degeneration of myelin	+ +	+ +	——	.....	+ +	+ +	.....	——	+ +	+ +	.....	——
Staining of paraneurotic fat from injection	+ +	.....	.....	.....	+	.....	.....	.....	+ +	.....	.....	.....

* Nissl bodies not stained well; subjected to too much heat in embedding.

Dog No. II.—Dog was a puppy; nerves small; therefore injection does not seem to have taken well; left supraorbital taken as control.

	Right Supraorbital				Brachial Plexus			
	At	Distal	†Proximal	§Ganglia	‡At	Distal	Proximal	§Ganglia
Focal necrosis	Slight..	.....	.....	.....	Slight..	.....	.....	.....
Round cell infiltration	Slight..	.....	.....	.....	.....	.....	.....	.....
Polymorphonuclear leucocytes	.....	.....	.....	.....	.....	.....	.....	.....
Derangement of nerve fibers	Slight..	.....	.....	.....	Slight..	.....	.....	.....
Degeneration of myelin	Slight..	Slight..	Slight..	——	Slight..	Slight..	.....	.....
Staining of paraneurotic fat at seat of injection	+	.....	.....	.....	.....	.....	.....	.....

* Just above point of injection. † Diffusion of Nissl's bodies in many cells; nucleus at periphery of cell.
‡ Injection does not seem to have penetrated well. § Diffusion of Nissl's bodies; peripheral location of nuclei.

Dog No. III.—This dog was also a small puppy, consequently injections were made with considerable difficulty and did not prove as satisfactory as on the first dog, which was very large and whose nerves were large, so that the osmic acid was easily retained within the sheath.

	Right Supraorbital				Left Supraorbital				Cord of Brachial Plexus			
	At	Distal	Proximal	*Ganglia	At	Distal	Proximal	†Ganglia	At	Distal	Proximal	§Ganglia
Focal necrosis	Slight..	.....	.....	.....	+	.....	.....	.....	Slight..	.....	.....	.....
Round cell infiltration	Slight..	.....	.....	.....	+	.....	.....	.....	Slight..	.....	.....	.....
Polymorphonuclear leucocytes	.....	.....	.....	.....	.....	.....	.....	.....	Few...	.....	.....	.....
Derangement of nerve fiber	+	.....	.....	.....	Slight..	.....	.....	.....	+	.....	.....	.....
Degeneration of myelin	Some..	.....	.....	——	Slight..	Slight..	.....	.....	+ + +	+ + +	Slight*	.....
Staining of paraneurotic fat from injection	+	.....	.....	.....	+	.....	.....	.....	+	.....	.....	.....

* Immediately above point of injection. † Diffusion of Nissl bodies in many cells; nuclei of many cells at periphery. ‡ Slight changes as recorded in other nerve. § Diffusion of Nissl's bodies quite marked, also peripheral location of nuclei.

Dog No. IV.

	Right Supraorbital				Left Supraorbital				Cord of Brachial Plexus			
	At	Distal	Proximal	*Ganglia	At	Distal	Proximal	†Ganglia	At	Distal	Proximal	‡Ganglia
Inflammatory reaction	.....	.....	.....	.....	Slight..	.....	.....	.....	.....	.....	.....	.....
Focal necrosis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Derangement of fibers	Slight..	.....	.....	.....	+	.....	.....	.....	Slight..	Slight..	.....	.....
Degeneration of myelin	+ +	+ +	.....	.....	+	Slight..	.....	.....	+ +	Slight..	.....	.....
Diminution in caliber	Slight..	Slight..	.....	.....	+	.....	.....	.....	.....	.....	.....	.....
Leucocytic infiltration	Occas'l	.....	.....	.....	Slight..	.....	.....	.....	.....	.....	.....	.....
Blackening due to osmic acid injection	+ *	.....	.....	.....	+	.....	.....	.....	+	.....	.....	.....

* Eosin affects the myelin of a few fibers, blackening the sheath uniformly. † No marked changes. ‡ No changes.

Two pieces were taken at the point of injection, proximal to, and distal to the point of injections and put in Mueller's fluid, 90 parts, formalin 10 parts. After one to two days, sections from each portion were washed in water for 24 hours, mounted in paraffin and stained with hematoxylin and eosin. The remaining pieces were left for two weeks in Mueller's fluid, which was changed several times to get rid of the formalin. They were then placed in Marchi's mixture, which consists of Mueller's fluid 2 parts, 1 per cent. osmic acid, 1 part, and left for six days. They were then washed in water for two days and afterwards remounted in paraffin. By this method any fatty degeneration occurring in the myelin sheath of the nerve fibers can be demonstrated. It has been found that myelin which has been mordanted for eight days or over in Mueller's fluid or other solutions of the bichromates, loses the power of reducing osmic acid, while fat retains this property unimpaired. The gasserian ganglia and the cervical ganglia connected with the exsected pieces of nerve were removed and placed in Zenker's fluid and stained with hematoxylin-eosin and by Nissl's method after they were mounted in paraffin. Specimens were taken from the cervical cord to be examined later if changes elsewhere should warrant it.

Microscopic Examination.—The most important changes were found at, and distal to the point of injection. The degree of pathologic alteration varied to a considerable extent dependant on the thoroughness of the injection and whether infection had resulted. For example, in one nerve that to all appearances was perfectly injected and blackened throughout, degenerative processes were found only in a limited portion. At the point of injection there was always more or less staining of the paraneurotic and interstitial fat with the osmic acid. There was quite marked derangement of the fibers. The inflammatory reaction was always less extensive than might naturally be expected. An occasional area of focal necrosis, a few foci of round cell infiltration, and here and there a leucocyte, attracted thither by the foreign substance, were all that was to be noted.

Distal to the point of injection the nerve trunk in some cases seemed atrophic, but there were no interstitial changes. Proximally, no changes were to be found except in the immediate vicinity of the injection. At and distal to the point of injection, there was more or less extensive fatty degeneraton of the myelin sheath, this varied in amount from the involvement of all the fibers to an occasional fiber. Proximally the myelin was unaffected, except immediately above the limit of blackening, which was our means of defining the extent of injected area.

There were no signs of inflammation in the ganglia. Slight changes, similar to those one would be led to expect after nerve resection, were present. The nuclei of many of the cells were located at the periphery and the stainable substance of Nissl was diffused throughout the cytoplasm.

(To be continued.)

NOTE.—The conclusion of Dr. Murphy's article next week will be followed by the discussion on the papers of Drs. Sherman, Frazier and Murphy.

BLOOD PRESSURE AND PULSE RATE.

AS INFLUENCED BY DIFFERENT POSITIONS OF THE BODY.*

O. Z. STEPHENS, A.M., M.D.
Department of Physiology, Northwestern University Medical School.
CHICAGO.

HISTORY.

The blood pressure in the arteries was first measured with some degree of accuracy by Stephen Hales in 1733. He ordered a mare to be tied down on her back, into whose crural artery, about three inches from her belly, he inserted a brass pipe one-sixth inch in diameter. To this pipe, by means of another brass pipe, he fastened a glass tube 9 feet long, and of nearly the same diameter as the pipe in the artery. He then untied the ligature on the crural artery, as a result of which the blood rose 8 feet 3 inches above the level of the ventricle of the heart.[1]

While blood pressure can be measured in this way with some degree of accuracy, there are several objections to the method, chief among which are the following: 1, Through the uncomfortable position of the animal and the consequent effect on the vasomotor nerve fibers, the pressure is likely not to be the same as it would under normal conditions; 2, the inaccuracy due to the speedy coagulation of the blood; 3, the clumsiness and inconvenience of the apparatus.

Poiseuille, many years later, improved this method of Hales by substituting for the glass tube a mercurial manometer. The tube connecting this manometer with the artery was filled with a solution of sodium carbonate to prevent coagulation of the blood.[2]

Later, Ludwig made an improvement on Poiseuille's mercurial manometer by placing on the mercurial column a float carrying a writing style, by means of which records of the variation in pressure could be taken on revolving drums. By means of the apparatus a fair degree of accuracy can be obtained, but the oscillations of the mercurial column, due to inertia, render it objectionable. The mercurial manometer, however, has been used very extensively and with very valuable results.

Piorry, a noted French physician, was one of the first to observe the effect of the force of gravity on the circulation, i. e., the effect of the change of position on the blood pressure. His observations, however, were clinical. Having been called to a patient who had lost consciousness, and who was being supported in a sitting position by his friends, he placed him in a horizontal position, after which the patient at once regained consciousness. Hill has also found, through a trephine hole in the skull, that the intracranial pressure is negative in the sitting posture and positive when the head was bent down toward the knees.[3]

Many other observations of the same nature have been observed clinically on the human subject and experimentally on the lower animals.

Most of the work on the lower animals has been done by inserting a cannula connected with a mercurial manometer into the carotid or femoral artery, and then shifting the animal from one position to another, about a horizontal axis which passes through the point of insertion of the cannula. In this way, quite accurate results have been obtained. Of course the animals were invariably narcotized or anesthetized.

So far as we have been able to learn the experimental observations on blood pressure in different positions of the body have been confined to the horizontal, vertical feet-down and vertical feet-up positions. The same is true of the pulse rate. The clinical observations have been confined to the horizontal, head-up and head-down at no particular angle.

Since the advent of the sphygmomanometer, experiments have been performed on the healthy human subject in the standing, sitting and horizontal postures.

The pulse rate in the human subject in different positions of the body, so far as we have been able to learn,

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Pathology and Physiology, and approved for publication by the Executive Committee: Drs. V. C. Vaughan, Frank B. Wynn and Joseph McFarland.

1. "Statistical Essays," vol. ii, after Hill-Schäfer's Text-book of Physiol., 1900, vol. ii.
2. "Rech. sur la force du coeur aortique." Thèse, Paris, 1828, after Hill-Schäfer's Text-book of Physiol., 1900, vol. ii.
3. Hill: Journal Physiol., Cambridge and London, 1895, vol. xviii, p. 15.

was first studied by Guy,[4] who made observations on 100 men, averaging 27 years of age, in the standing, sitting and lying positions. He found the pulse rate to be highest in the standing, lower in the sitting and lowest in the lying positions.

We see, then, that the subjects of blood pressure and pulse rate in different positions of the body are not new ones; that some of the apparatus used in getting blood pressure was inaccurate; that experimental observations were on narcotized or anesthetized animals; that clinical observations on blood pressure in the different positions of the body are confirmatory of the experimental observations.

In our work on blood pressure we have dealt with the subject in a different manner, in some respects, from our predecessors, insomuch as we have chosen more positions of the body and have taken the pressure on both sides of the body in each position.

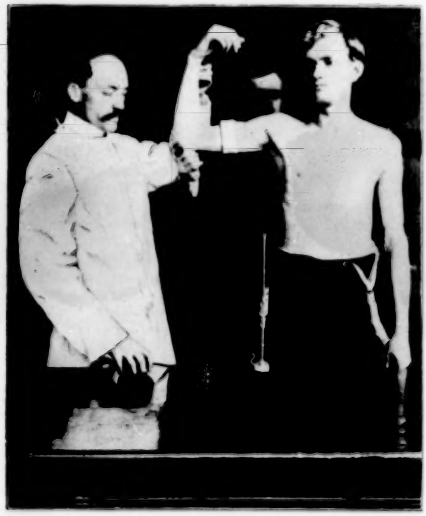


Fig. 1.—Standing.

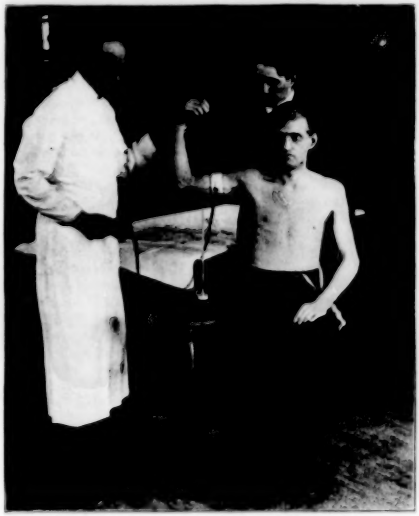


Fig. 2.—Sitting.

METHOD.

(*a*) *Subjects*.—The subjects used in these experiments were twenty-two male medical students, with an average age of 24 years and an average height of 170 cm. In one of these subjects, however, the pulse rate was not obtained, hence only twenty-one are used in making computations on pulse rate. In changing from one position to another, they were allowed to remain long enough in the new position for the circulatory apparatus to become adjusted to the new conditions before observations, either on blood pressure or pulse rate, were taken. Every means was taken to keep them comfortable and to avoid anything which would tend to provoke excitement or muscular effort. The rate of respiration was also kept normal.

(*b*) *Apparatus*.—The instrument used in taking the blood pressure was the Riva Rocci sphygmomanometer, as modified by H. W. Cook. The instrument is now so well known among physiologists that a description of it here is not demanded.

(*c*) *Technic*.—Each of the twenty-two men were taken through the following positions: 1, Standing; 2, sitting; 3, supine; 4, head down at an angle of 45 degrees; 5, right lateral; 6, left lateral.

The blood pressure was taken in both brachial arteries in each position by placing the band of the instrument around the upper arm midway between the elbow and shoulder.

The pulse rate was also taken in each position, the count being taken through a whole minute of time.

In taking the pressure in the standing position, the patient stood erect, the upper arm was abducted to the horizontal plane and the forearm flexed at right angles to the brachium and held perpendicularly, with the hand uppermost. The arm was supported in this position by an assistant in order to relieve the subject of any muscular effort in sustaining the arm himself. The opposite arm was allowed to hang laxly by the side.

In the sitting position, the subject sat on a stool, with the thighs parallel and flexed at right angles to the axis of the body. The legs were flexed at right angles to the thighs. The arm in which the pressure was taken was held in the same position in relation to the body, as it was in the standing posture (the assistant supporting it), while the hand of the opposite arm lay laxly on the thigh of the same side.

The subject in the supine posture lay flat on his back with legs parallel, and the arm on the opposite side to the one in which the pressure was taken lay parallel with and along side of the body. The arm in which the pressure was taken was abducted to right angles with the body axis, and the forearm at right angles to the brachium and held perpendicularly. Thus it is seen that the arm did not take the exact relation to

4. Hill-Schäfer's Text-book of Physiol., 1900, vol. II.

V 4
190

the body in this position that it did in the standing and sitting postures. In the latter, the brachium was so rotated that the inner aspect faced forward, while in this position the inner aspect of the brachium faced toward the feet, having rotated through an arc of 90 degrees. The variation in blood pressure, due to this slight difference in the relative position of the arm, if there be any variation at all, would certainly be too insignificant to be taken into account.

The subject in the head-down position was placed on a table on his back, around his ankles were placed comfortable straps, which were fastened to one end of the table. The end of the table was then elevated so that the subject hung with his head down, at an angle of 45 degrees. The arms assumed practically the same position, in relation to the body, as they did in the supine position, the forearm of the arm operated on being held perpendicularly, and the opposite arm lying along side of the body.

In the right lateral position our subject lay on the

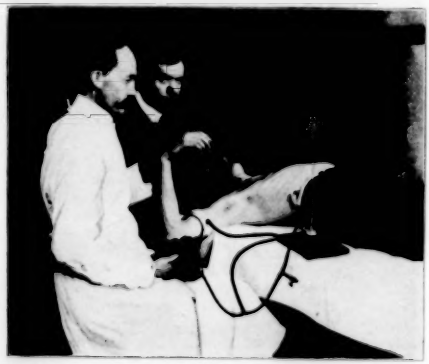


Fig. 3.—Supine.

right side, the head raised to the horizontal level by a pillow, the legs parallel and straight, and the left arm parallel with and on the body. The right arm was extended anteriorly at right angles to the body axis, the forearm flexed at right angles to the upper arm and held perpendicularly when the pressure was taken in this arm. When the pressure was taken in the left arm in this posture, the right arm was allowed to assume a position most comfortable to the subject, in order to obviate any nervous influence on the circulation which might arise from the subject being uncomfortable. The left arm assumed the same relation to the body as it did in the supine when the pressure was taken in it. This, of course, put the forearm in a horizontal plane.

The left lateral position is a repetition of the right lateral in reversed order, and need not be detailed further.

RESULTS.

After the pressure in each brachial was taken in a given position, the two results were averaged to obtain a mean pressure in that position. The results of such observations, together with the pulse rate, are shown in the following table:

TABLE NO. 1.

No.		Standing.	Sitting.	Supine.	Head-down.	Right Lateral.	Left Lat.
1	Right arm	134	142	174	185	172	125
	Left arm	122	152	150	174	124	163
	Pulse rate	97	90	72	69	68	72
2	Right arm	146	153	165	170	157	119
	Left arm	146	153	155	171	118	158
	Pulse rate	85	81	64	57	59	63
3	Right arm	106	115	128	137	126	81
	Left arm	117	120	134	153	94	133
	Pulse rate	70	57	53	50	56	58
4	Right arm	134	146	177	199	193	135
	Left arm	121	145	158	179	128	192
	Pulse rate	93	87	83	87	84	78
5	Right arm	110	113	140	148	132	93
	Left arm	112	123	158	147	99	133
	Pulse rate	102	88	77	79	80	79
6	Right arm	133	143	157	159	140	108
	Left arm	136	138	159	151	111	170
	Pulse rate	118	93	71	71	88	78
7	Right arm	131	124	179	216	186	141
	Left arm	155	171	186	240	147	213
	Pulse rate	86	81	71	64	69	63
8	Right arm	124	127	140	143	150	108
	Left arm	102	107	145	193	115	145
	Pulse rate	...	...	...	...	...	...
9	Right arm	127	129	134	148	144	92
	Left arm	114	118	130	136	96	134
	Pulse rate	86	78	64	65	74	70
10	Right arm	115	130	138	159	129	116
	Left arm	109	101	132	153	119	131
	Pulse rate	110	98	86	76	90	87
11	Right arm	141	142	149	169	181	112
	Left arm	139	135	149	165	122	151
	Pulse rate	70	69	60	56	59	59
12	Right arm	130	139	146	167	154	110
	Left arm	137	136	145	171	111	158
	Pulse rate	103	97	80	83	78	77
13	Right arm	136	141	154	169	155	89
	Left arm	117	116	141	164	108	137
	Pulse rate	75	69	65	74	67	67
14	Right arm	127	124	146	151	134	92
	Left arm	113	115	133	153	90	137
	Pulse rate	72	60	53	48	53	50
15	Right arm	152	132	165	169	157	123
	Left arm	134	137	156	168	122	153
	Pulse rate	83	81	76	73	77	75
16	Right arm	111	100	126	122	119	73
	Left arm	115	116	129	133	95	134
	Pulse rate	90	92	69	68	67	75
17	Right arm	134	150	154	177	152	105
	Left arm	125	141	161	184	110	157
	Pulse rate	71	70	62	58	59	58
18	Right arm	164	152	170	203	195	135
	Left arm	156	161	178	218	134	198
	Pulse rate	92	84	74	76	77	75
19	Right arm	154	151	180	188	180	127
	Left arm	151	150	169	183	112	180
	Pulse rate	82	83	78	62	71	66
20	Right arm	122	119	142	153	159	111
	Left arm	110	113	127	158	98	155
	Pulse rate	76	75	59	58	63	62
21	Right arm	127	124	159	162	143	96
	Left arm	133	127	133	161	111	157
	Pulse rate	77	72	62	58	63	66
22	Right arm	152	118	163	185	157	106
	Left arm	141	129	159	189	128	165
	Pulse rate	67	65	55	59	61	60

In summarizing the above data, we used the Hall-Quetelet method.[5] This method uses the median value, instead of the average or arithmetical mean. The data collected from each individual are recorded on a card. The cards from the several individuals are grouped as desired. We grouped our cards according to the pulse rate and blood pressure in each arm in the different positions of the body. For illustration, let us take the blood pressure in the right arm in the standing position; and let us take all those cards showing a blood pressure of 105-110 mm. Hg, inclusive, and place them in one group, and all those showing a pressure of 110-115 mm. Hg in another group, etc., till we have all the twenty-two cards placed in groups, the difference between the minimal values of which is 5 mm. Hg pressure. We shall then have the following table:

TABLE NO. 2.

Blood pressure	105+	110+	115+	120+	125+	130+	135+	140+	145+	150+	155+	160+
No. of observations	1	2	1	2	3	6	1	1	1	3	0	1

In adding the number of observations shown in the table, we get a total of 22, which corresponds to the number of subjects in whom the pressure was taken.

5. THE JOURNAL A. M. A., Dec. 21, 1901.

The next step is to find the median value, which Dr. Hall defines thus: "The median value is that value which is so located in the whole series of observations of a single measurement of a single group that there are as many above it as below it; i. e., that the number of values which it exceeds is equal to the number of values which exceed it." Since the number of observations is 22, the median value, therefore, will have on one side of it 11 values, which are less, and on the other side 11 values, which are greater than itself. We must, then, find the eleventh value. In counting from left to right, we find that the eleventh value lies in the group 130 mm. Hg, and is the second from the minimal value and fourth from the maximal value of this group. The median value, therefore, lies in this group, which may be called the median group. We know, then, that it must be between 130 mm. Hg, the minimal value of the group, and 135 mm. Hg, the minimal value of the next higher group. Now, according to the biologic laws, the six values in this median group will be practically evenly distributed throughout the 5 mm. Hg pressure between its minimal value and the minimal of the next higher group. Hence the second value from the left must be 130 mm. Hg pressure, plus 2/6 of 5 mm. Hg pressure, which equals 131.6 mm. Hg, the pressure for the right arm in the standing position.

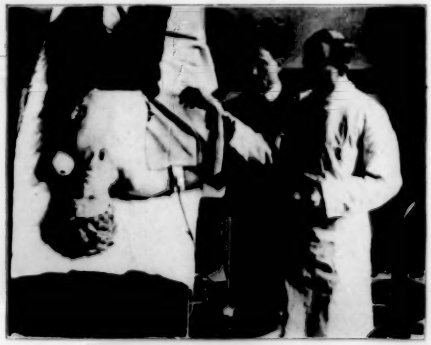


Fig. 4.—Head down.

Dr. Hall has also reduced this process to a mathematical formula, thus:

"Let n equal total number of observations; m equal the number of observations in the median group; l equal the sum of observations to the left of median group; r equal the sum to the right; a equal the minimum value of the median group; d equal the arithmetical difference between the minimum values of the groups, and M equal the median value to be determined."

Then

$$M = a + \frac{d(n-2-l)}{m}$$

$$M = a + \frac{d\left(\frac{n}{2}+2-l\right)}{m}$$

$$M = 130 + \frac{5\left(\frac{22}{2}-9\right)}{6} = 131.6 \text{ mm. Hg pressure by substituting the values of the letters in the above cases.}$$

In taking the arithmetical mean, however, we get a pressure of 132.2 mm. Hg. In observing the table, we see that we have one observation of quite high pressure. This slight increase of the average over the median value is doubtless due to this one observation.

In a large number of observations the dwarf values are likely to balance the giant values, in which case the arithmetical mean is an accurate though time-consuming method of evaluating data. In a small number of observations, however, one extreme is more certain to overbalance the other, and in this case the Hall-Quetelet method is the only accurate one. It is also accurate in handling large numbers and is much simpler and more easily applied than the old method.

Our data pertaining to the pulse rate and blood pressure in both brachial arteries, in the different positions enumerated above, were handled in this manner, the summary of the results of this evaluation being given in the following table:

TABLE NO. 3.

	Standing.	Sitting.	Supine.	Head down.	Rt Lat.	Lt. Lat.
Right arm	131.6	123.3	132.5	166.2	155	110
Average	130.8	131.7	130.4	165.6	134.5	133
Left arm	130	130	148.3	165	114	156
Pulse rate	86	82	68.7	65.8	68.1	69.1

DISCUSSION OF EFFECTS ON BLOOD PRESSURE.

In scanning this table, it is seen that the average blood pressure in the two arms increases in the standing, sitting, supine and head-down positions, respectively, while the pulse rate decreases. It has been considered that the blood pressure varies as the heart rate, times the heart strength times the resistance.

Expressed in terms of a formula, we have P varies as Hr × Hs × R, where P equals blood pressure, Hr, the heart rate, Hs the heart strength, and R the resistance.

This resistance may be due to arterial causes—arterial resistance; it may be due to the capillaries—capillary resistance; it may be due to contractions of the arterioles—peripheral resistance; it may be due to venous causes—venous resistance; or it may be due to the effect of gravity on the circulation—hydrostatic resistance.

Now, it remains to be seen whether the phenomena observed in Table 3 can be explained by means of this formula.

Standing Position.—We see that the average blood pressure in the standing position is lower and the pulse rate is higher than in any other position in the series. Here the current meets with the least arterial and hydrostatic resistance on the arterial side of the circulation, and with the greatest hydrostatic resistance on the venous side. Both of these factors tend to decrease the pressure in the upper portions of the body by tending to allow the accumulation of blood in the lower portions of the circulatory system. This is partially compensated for, however, by the abdominal muscles and contraction of the arterioles in the splanchnic area.[3]

Sitting Position.—The average pressure in the sitting position is nearly 1 mm. Hg. greater than in the standing position, a difference almost so slight in itself as to be ignored. But when we observe that the pulse rate in this position has decreased four beats to the minute, more importance attaches to this slight rise in pressure, and we begin to wonder why the pressure did not sink with the lowering of the heart rate.

According to the formula, P will vary with Hr where Hs and R remain constant. Therefore, if Hr decreases, P will decrease also. If P does not decrease when Hr decreases, but, on the contrary, remains constant or increases, it is evident that the variation of Hr is counterbalanced or more than counterbalanced by the varia-

tion of either Hs or R, or both, in an opposite direction. Can we account in any way for a sufficient rise in Hs or R, or both, to produce the slight rise of P against the decrease in Hr?

It will be recalled that in the sitting position the thighs were flexed at right angles to the body axis, and the legs at right angles to the thighs; that the body was sustained erect on the pelvis, and the hand of the arm not being operated on was lying relaxed on the thigh of the same side. The blood, then, must take a somewhat different course in this position from what it took in the standing position, i. e., it must course around two right angles in each leg—one at the inguinal region and one at the knee. It also deviates slightly from a straight line at the elbow of the arm not being operated on. Thus the blood in two of the largest arteries turns two right angles in each lower extremity, and one large artery turns an angle of approximately 45 degrees at the elbow. The same is true of the veins in the same localities. This introduces an arterial and venous resistance which did not exist in the standing position.

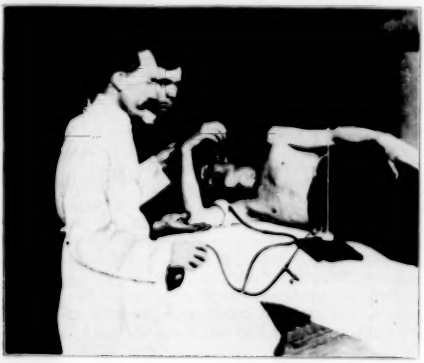


Fig. 5.—Right lateral, lower arm.

Fig. 6.—Right lateral, upper arm.

It is possible, too, that the capillary resistance may be increased by compression of the gluteal region and upper part of the thigh by the weight of the body on them.

It has been stated that through the influence of the vasodilator nerve fibers the flow of blood to a contracting muscle is increased.[6] If this be true, the flow of blood to the muscles of the lower extremities will be increased while the muscles are contracting to maintain the body in a standing position. This increased flow of blood to the lower portions of the circulatory system will tend to raise the pressure here and lower it in other portions of the arterial system.

The relaxation of these muscles in the sitting position, however, with practically the same tension of the abdominal muscles and the muscles of the back in maintaining the trunk erect on the pelvis, prevents the increase of flow of blood to the lower extremities, which results in higher pressure in the rest of the arterial system, i. e., the peripheral or arteriolar resistance is increased in this position.

The force of gravity also plays an important rôle. In a man 6 feet high the hydrostatic pressure of a column of blood reaching from the vertex to the sole of the foot is equal to 140 mm. Hg, and from the vertex to the middle of the abdomen about 50 mm. Hg.[7] If this statement be true, the hydrostatic pressure in a man 5 feet 8 inches high—the average height of our 22 subjects—will be about 134 mm. Hg. Now, if the average distance from the bend of the femoral artery in the inguinal region to the bend of popliteal behind the knee be about 40 cm., the hydrostatic pressure in this position will not be 134 mm. Hg by 31.5 mm. Hg, the pressure of a column of 40 cm. There will be 40 cm. of the column of 170 c.m (5 feet 8 inches), on which gravity exerts a pressure downward on only the lower wall of the vessel. This column of 40 cm. of blood, meeting resistance to its downward tendency, has no effect through its own weight in the column in the leg below it as it had in the standing position, but tends to check the flow of the column above. The latter, by its own weight or hydrostatic resistance, and the elastic force of the arteries must sweep this 40 cm. of blood through a horizontal distance of 40 cm. In overcoming this extra hydrostatic resistance, the column above must necessarily experience a rise in pressure. Thus the decrease in the hydrostatic resistance due to the decrease in height of the column of blood, is reacted on by the increased pressure due to the hydrostatic resistance of the 40 cm. to be moved in a horizontal plane. This is true on both the arterial and venous sides of the circulatory system. Whether or not these two factors balance we do not know. However, to summarize, we see that we have an increase in the arterial, venous, capillary and peripheral resistances, and also the hydrostatic resistance due to the horizontal column of blood. We also have a decrease in the hydrostatic resistance due to a decrease in height of the blood column.

Now, since we have an increase in P and decrease in Hr, it is evident that the increasing factors of R must more than counterbalance the decreasing factor, since the respiration was kept normal and all nervous stimuli avoided which would tend to increase Hs. This increased pressure is shared by the coronary arteries, in consequence of which an increase of nutriment is carried to and increased tension placed on the heart muscle, both of which tend to increase the heart strength.[7]

6. Stewart: Manual of Physiol., 1900, p. 153.

7. Roy and Adami: Philosophical Trans. of the Royal Society, 1892, vol. clxxxiii, B., pp. 90, 262.

It is clear, then, that the total increase in P is not due alone to the increased resistance, but is brought about partially by the increase in the heart strength. This increase of the heart strength, however, results from the increased pressure due to the increased resistance. Just what proportion of the total increase in P is due to the increase in R, and what proportion is due to the increase in Hs, we do not know. We conclude, therefore, that the increased blood pressure in the brachials in the sitting position over that in the standing position is due to an increase in both the resistance and the heart strength.

Supine.—In referring to Table 3, the median pressure in the supine position is seen to be 150.4 mm. Hg, a distinct rise over that in the two previous positions. We see, also, that the pulse rate has decreased to 68.7 beats per minute, a distinct decrease below that in the two previous positions. Therefore, since P is higher and Hr lower than in the two other positions, it is clear that Hs or R, or both, have made a greater increase.

Hill of London has shown that, when the body of one of the lower animals takes the vertical feet-down position, the blood pressure falls in the carotids and at the same time rises in the femorals. When the body resumes the horizontal position the pressure increases in the carotids and decreases in the femorals, as compared with what it was at first. When the animal is placed in the vertical feet-up position, the pressure still further rises in the carotids and falls in the femorals. These phenomena he attributed to the hydrostatic pressure of the blood. Again, if the phrenic nerves be divided when the animal is in the vertical feet-down position, the pressure will still further fall in the carotids and rise in the femorals. Furthermore, if a crucial incision be made in the abdominal walls, the pressure falls still further in the carotids and rises in the femorals. These phenomena, he attests, point to a compensatory apparatus in the splanchnic area and the abdominal walls, since compression of the latter will cause the pressure to rise in the carotids and fall in the femorals. This compensatory apparatus, he thinks, becomes more nearly complete in animals that assume more nearly the vertical position as their natural posture; therefore, more nearly complete in man.[8]

The clinical experience of Piorry, cited above, and of many others, also shows the effect of gravity on the circulation in the supine position. When the subject is placed on his back the blood which previously tended to gravitate to a plane below the heart, especially into the spacious venous system of the splanchnic area, now tends to become more equally distributed throughout the circulatory system, since this system has taken a horizontal position. This tends to increase the hydrostatic resistance in the plane of the heart and above it, through an increased flow of blood to these regions and to lower it in the planes below through a correspondingly decreased flow to those regions.

At the same time, the hydrostatic resistance is further increased by the blood in the arterial system having to be moved along a horizontal plane at right angles to the force of gravity.

It is decreased, however, in the lower portions of the venous system by a force equivalent to the difference between that required to raise the return circulation to the level of the heart, and that required to move it through a horizontal plane throughout the venous system. It is increased, however, in the upper portions of this system through the general tendency of the blood to become equally distributed throughout the circulatory system.

The increased hydrostatic resistance in the circulatory system tends to strengthen the heart beat by increasing the nutriment to and the tension on the heart muscle. This increased force of the heart "may more than counterbalance the increase in the resistance to the contractions of the left ventricle which that rise introduces, so that the ventricle may contract more completely than it did before the pressure was raised."[8]

It may be possible that the capillary resistance is slightly increased in this position by the weight of the body on the tissues of the back; this is evidently small, as the body rests largely on bony prominences, such as the sacrum, shoulder blades, etc., leaving the large muscular areas of the back practically free from pressure.

We see, then, that there is an increase in the hydrostatic resistance in the arterial system and upper portions of the venous system; that because of this increase of hydrostatic resistance the heart's action is strengthened; that there is a possible slight increase in the capillary resistance; that there is a decrease in hydrostatic resistance in the lower portions of the venous system.

Now, since P has increased, we are forced to conclude that the increase in Hs and R more than counterbalances the decrease in R in the lower venous system. Furthermore, that the ultimate factor in bringing about the increase in P in this position is the hydrostatic resistance.

Head-Down Position.—Referring again to Table 3, it is observed that the blood pressure in the head-down position has made a leap of over 15 mm. Hg above what it was in the supine, being now 165.6 mm. Hg. It will also be noticed that the heart rate has been lowered almost three beats per minute, the rate now being 65.8. Now, since the pressure is the greatest and the heart rate is the lowest in this position, it is evident that the heart strength or the resistance, or both, have experienced the greatest increase.

Since the man is on an inclined plane with the head downward, it is clear that the blood will tend to course toward the head through the influence of gravity. This produces an increased hydrostatic resistance in the upper portions of the circulatory system, which is greater than it was in the supine, since gravity acts on an angle of 45 degrees with the course of the blood, instead of 90 degrees. It is also greater than in the standing and sitting postures, since in the latter gravity acts in a straight line with the blood stream and tends to pull it to the opposite extreme of the circulatory system.

The hydrostatic resistance in this position is equivalent to that of a column of blood extending perpendicularly between the plane of the feet and that of the brachial artery, a distance of about 99 cm., with a pressure of about 78 mm. Hg.

According to Hill,[8] the increased hydrostatic pressure in the carotids in the vertical head-down position is partially compensated for by a decrease in the resistance in the splanchnic area, brought about through the vasodilator mechanism; but this compensation is far from complete.

The same may be said in regard to the capillary resistance here, as was said in case of the supine; if there be an increase it must be slight.

The hydrostatic pressure, being greater in the upper portion of the circulatory system than it was in the pre-

8. Roy and Adami: Philosophical Trans. of the Royal Society, 1892, vol. clxxxiii, B., p. 269.

vious postures, will necessarily be shared to a greater extent by the coronary arteries, in consequence of which there will be a greater increase of nutriment to the heart muscle. The tension on the heart will also be greater. We conclude, therefore, that the strength of the heart is greatest in this position.

Lateral Positions.—In Table 3 it will be seen that the pressure in the right lateral position is 134.5 mm. Hg, and the pulse rate is 68.1 beats per minute; in the left lateral the pressure is 133 mm. Hg, and the pulse rate 69.1 per minute. Here the same general law holds good—that the pulse rate decreases as the pressure increases. But we notice that the pulse rate approximates that in the head-down position, while the blood pressure approaches that in the standing and sitting postures, i. e., the pressure is lower compared with the pulse rate than in the other lying positions.

Now, since the pulse rate is much lower and the blood pressure slightly higher in these positions than in the standing and sitting positions, it is manifest that both the heart strength and resistance, or either one of them, must be increased to a greater extent than in the latter. For convenience we shall take the average pressure and pulse rate in these positions in comparing them with the others, and later take the two separately, in comparing them with each other. The following table will then be useful:

TABLE No. 4.—LATERAL POSITIONS.

	Right Arm.	Left Arm.	Average.	Lower Arm.	Upper Arm.
Blood Pressure	134.5	133	133.8	155.5	112
Pulse Rate	68.1	69.1	68.6	.....	...

This table shows the average blood pressure in these positions to be 133.8 mm. Hg and the average pulse rate 68.6 beats per minute. By comparing these figures with those in Table 3 we see the pulse rate is nearly the same as in the supine, and but slightly higher than in the head-down positions, while the pressure is much lower. That means that the heart strength, the resistance, or both, have decreased.

How can we account for these phenomena? In the first place, how can we account for the slight increase in the pressure over the great fall in the heart rate from what it was in the standing and sitting positions? In the latter a comparatively small amount of blood was moved along a horizontal plane by the heart force, thus overcoming the hydrostatic resistance due to gravity acting at right angles to the blood current, while in the lateral positions the blood moves nearly horizontally through the entire circulatory system.

Here, also, the blood tends to become more equally distributed throughout the circulatory system. This results in a lowered hydrostatic resistance in the lower portions of the body, with a corresponding increase in the upper portions.

In this position it will be recalled that the lower arm was extended anteriorly at right angles to the body axis. Instead of the blood passing from the subclavian artery through the branchial in a straight line to the elbow, it deviates 90° from this course and passes directly forward. This offers a greater resistance to the blood current above, and at the same time tends to lessen the pressure in the radial below it. We conclude, therefore, that because of this variation the systemic pressure is somewhat higher than is recorded in the above table. This is a greater arterial resistance than we had in the standing and less than in the sitting positions. In the upper arm the forearm was horizontal instead of perpendicular, as it was in the other positions, while the brachium was perpendicular instead of horizontal. Hence, these two differences balance. Because of the increased resistance the heart force is also increased in the same manner as has been given above.

We see, then, that the hydrostatic resistance is greater in the planes of the heart and above it, in these positions, than in the standing and sitting positions; that the arterial resistance is slightly greater than in the standing, but less than in the sitting position; that the heart strength is increased because of the increased resistance. Now, since P is slightly higher and Hr much lower, Hs and R, one or both, must be much increased.

Now, why is the pressure lower than, and the heart rate nearly the same as, it was in the supine? In the latter the circulatory system lies practically in a horizontal plane. In the lateral positions it is "on edge," as it were, and beside, the upper portion is slightly higher than the lower, since the distance from the central axis of the body to the point of the shoulder is somewhat greater than it is from the same axis to the most distant point of the crest of the ilium or great trochanter. This gives a slightly inclined plane, down which the blood tends to gravitate toward the feet, thus raising the pressure below the heart and lessening it above, as compared with what it would be in the supine position. The resistance, therefore, being less, the heart strength will be less because of lessened nutrition to, and tension on, the heart muscle. The decrease in P, then, must be due to a decrease in Hs and R.

The same things are true in the head-down position as in the supine, but in a more marked degree. Here, however, Hs has decreased to a greater degree; hence, we conclude that P has decreased as a result of the decrease in Hr, Hs and R.

Now, Table 4 shows that the average pressure is 1.5 mm. Hg greater and the pulse rate a half beat less in the right than in the left lateral position. How may this slight rise of pressure be explained?

The aorta passes from the left ventricle upward and slightly forward and to the right. It then curves backward, upward and to the left. Therefore, in the right lateral position the heart lifts the greater portion of blood against the force of gravity to the perpendicular distance between the planes of the mouth of the ascending and the beginning of the descending aorta, respectively. It also turns this blood through a semicircle in its course through the arch. In the left lateral this resistance is absent. The force of gravity alone would be sufficient to take the blood around the arch of the aorta after it reaches the top of the ascending portion. This increased resistance in the right lateral in turn produces a greater heart strength. It is clear, then, that the increase in P is due to an increase in Hs and R.

DISCUSSION OF EFFECTS ON PULSE RATE.

"The mere fact that the centripetal fibers which call the vagus into play by reflex action come chiefly from the heart itself, shows that one part, and a very important part, of the vagus function is to reduce the work done by the heart in the interest of the heart itself. We conclude, then, that the vagus acts as a protecting nerve to the heart, reducing the work thrown on that organ when, from fatigue or other causes, such relief is required by it. The fact, however, that there exists centripetal fibers which call the vagus center into activity, in such nerves as the sciatic and splanchnic, shows that the vagus mechanism may be called on to act in the in-

terests of other parts of the body whose circulation requires to be diminished. We conclude, therefore, that the vagus may be used by other parts of the body to diminish the blood pressure and the output of the heart, and thereby reduce the circulation.

"Among the organs whose protection against overcongestion is of the greatest importance, it need hardly be said that the central nervous system takes the foremost place. It is well known that if the intracranial pressure be raised artificially powerful excitation of the vagus center is produced. Vagus action also results from rise in the blood pressure in the systemic arteries, and the excitation thus produced can be shown to be due to the high pressure within the vessels of the central nervous system and not to any direct effect of the rise of pressure on the heart. We must, therefore, look on the vagus mechanism as a means by which the central nervous system gains protection against too great congestion.

"The dependence on the blood pressure of the degree of vagus action, and the readiness with which the vagus center in the medulla is called into play by a rise of the intracranial pressure, seem to us to indicate that the mechanism in question is especially employed in the interests of the central nervous system as well as the heart itself."

Now, if it be true that the vagus acts as a protecting nerve both to the heart itself and the central nervous system, it is clear that the reduced heart rate in the various positions of the body in the order named is in response to the action of the vagus in endeavoring to protect the heart and central nervous system against the increasing pressure.

SUMMARY.

1. The blood pressure increases in the brachials from the standing to the head-down positions, inclusively, in the following order: Standing, sitting, left lateral, right lateral, supine and head-down.

2. The greater the hydrostatic resistance in the upper portions of the circulatory system the greater the increase in pressure where the nervous and respiratory systems are kept normal.

3. An increase of resistance is accompanied by an increase in heart strength; the strength of the heart, therefore, will increase in the different positions in the following order: Standing, sitting, left lateral, right lateral, supine and head-down.

4. The pulse rate decreases in the same order that the blood pressure increases.

5. The decrease in the pulse rate is a conservative act on the part of nature to protect the heart itself and the central nervous system.

DISCUSSION.

DR. H. G. BRAINERD, Los Angeles, Cal.—Are these data altogether from pressure in the arm, or are they taken in any other way? Can they be taken in the temporal region or elsewhere? The Riva-Rocci apparatus, as I have it, is not adapted to use in the temporal region. I have been very anxious to find what the temporal blood pressure is and how it compares with the pressure in the arms. Would it not be necessary to use an air pad?

DR. WINFIELD S. HALL, Chicago—The Riva-Rocci apparatus, as it is furnished to us by the medical instrument houses, is not adapted to taking any measurements except those on the arms or legs. A very easy adaptation can be made for taking the pressure in the temporal artery. One has only to put a band around the head, insert an inflatable bulb between the band and the temporal artery, and inflate the bulb sufficiently to cut off the temporal pulse. Having thus a method of determining the pressure in the temporal artery, we could, at the same time, take the pressure in the brachial artery; and also perhaps that in the popliteal artery. With these three observations taken simultaneously one could compare not only the three different pressures, but could also get an idea of the average arterial pressure.

TREATMENT OF FRACTURES OF THE PATELLA BY LATERAL SUTURES.*

JOSEPH A. BLAKE, M.D.
NEW YORK.

The question as to the operative versus the mechanical treatment of fracture of the patella has been ably discussed in a number of papers in the last few years. Some of these have been read before this Association.

I do not intend to reopen this discussion, inasmuch as my contribution deals only with a detail in the technic of the open operation; yet it is only fair that, in order that I may not be misunderstood, I should state my position in the matter; the more so, since the principle of my technic is closely linked with the reasons for my views in regard to the treatment in general.

Fractures of the patella are divisible into two classes —those caused by direct and those caused by indirect violence. Or, as von Mikulicz[1] has very aptly put it, "blow" and "tear" fractures. To this classification he also added another which was the result of both, or a "combination" fracture.

The difference between the "blow" and the "tear" fracture is well known to all, yet the importance of its bearing on the question of treatment seems to be generally overlooked. In the fracture by direct violence, usually the bone alone suffers, and although it may be comminuted, there is little separation of the fragments. In the "tear" fracture, on the other hand, not only the bone but the lateral expansions of the quadriceps muscle on either side of the patella are likewise torn, and there is considerable separation of the fragments. In the "combination" fracture the injury to the soft parts is similar.

Great stress has been laid on the interposition of fibrous frills from the torn aponeurotic structures covering the patella by the advocates of the open operation. This interposition does not occur in the "blow" fractures, because these structures are not frilled.

The fractures by direct violence or blow fractures, then, do not offer indications for open operation, except for the reduction of otherwise irreducible displacements of the fragments, and in practice their treatment by mechanical methods will be found to yield excellent results. On the other hand, the treatment of the "tear" fractures by mechanical means is extremely unsatisfactory. These cases, unless contraindications exist, by reason of age or disease, should in my mind be operated on, particularly those to which a sound limb is a necessity.

The indications for operation consist, then, not in the extent of injury to the patella itself, but to the lateral extensions of the insertion of the quadriceps extensor muscle. The importance of these structures has been emphasized by von Mikulicz,[1] who termed them the "para patella ligaments." I have been accustomed to call them the lateral patella ligaments and for convenience shall adhere to that term. They are strong aponeurotic structures, which are directly connected

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Surgery and Anatomy, and approved for publication by the Executive Committee: Drs. DeForest Willard, Charles A. Powers and J. E. Moore.

1. J. von Mikulicz: British Med. Jour., Dec. 13, 1902, p. 1828.

with the tendon above and with the ligamentum patellæ below, and, in fact, extend its insertion laterally to the tuberosities of the tibia. On their deep surfaces they are intimately blended with the capsule of the joint.

In direct fractures of the patella, the lateral patella ligaments remaining intact, considerable power of extension is present, although the patient may not exercise it on account of pain. In such cases when voluntary trials at extension are made or when the knee is passively flexed little separation of the fragments will result. The function of the ligaments is so important that when these structures are torn as in the "tear" fractures, no operation based on the suture of the patella alone is correct. The lateral patella ligaments should be sutured as well. In fact, I have gone so far as to rely on suture of the lateral patella ligaments alone in the treatment of "tear" fractures, only employing enough other sutures of fine catgut to coapt the remaining fibrous tissues.

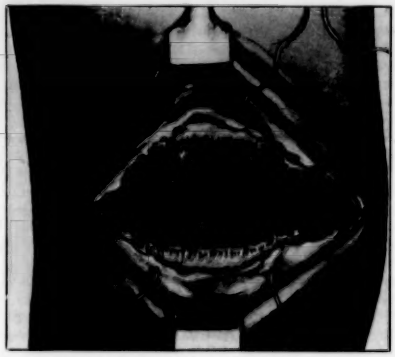


Fig. 1.—Showing the method of introducing the sutures close to the sides of the fragments and in front of the synovia.

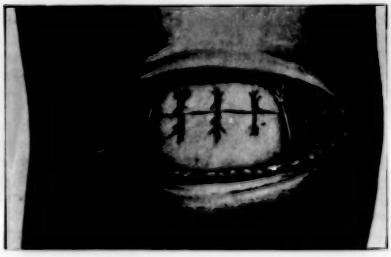


Fig. 2.—Main sutures tied with others to repair the extensions of the tears in the lateral patella ligaments and coapt the tissues in front of the patella.

OPERATION.

The steps of the operation are as follows: A curved transverse incision, one centimeter below the line of fracture and long enough to sufficiently expose the tears in the lateral patella ligaments, is made. The fringes of the aponeurotic tissues, which are usually found closely applied to the surfaces of the fracture are separated and trimmed off with scissors, and the blood clots washed out of the joint with a stream of sterile salt solution. All these manipulations are performed with instruments; not even the gloved fingers touch the tissues. Irritation of the synovia by sponging is abstained from.

A suture of strong chromicized catgut, No. 4 preferably, or kangaroo tendon is then introduced in the lateral patella ligament on each side of the patella in the following manner: A strong, full-curved Hagedorn needle is inserted one centimeter from the line of fracture and as close to one of the fragments as is possible, and brought out in the line of the tear just in front of the synovia; again introduced at a similar point at the margin of the opposite torn surface and hugging the other fragment it emerges one centimeter from the line of fracture on the anterior aspect of the lateral ligament (Fig. 1). The sutures are introduced on both sides of the patella before tying. It is very important that the sutures should be introduced as closely as possible to the fragments. The sutures are now tightened and tied simultaneously, and the coaptation of fragments will be found to be so exact (Fig. 2) that the slightest movement on one another in any direction is absolutely impossible on account of the interlocking of the slight irregularities of the surfaces.

Fig. 3.—E. W., female, age 35 years. Refracture of right patella. X ray four weeks after second operation.

The coaptation will be good even if the fragments are comminuted, provided the sutures grasp the tissues beyond the fragments.

The reason for the accurate coaptation lies in the fact that the stress of the sutures is exerted at right angles to the centers of the surfaces of the fracture, a feature which is not accomplished by any other method of suture with the exception of the purse string.

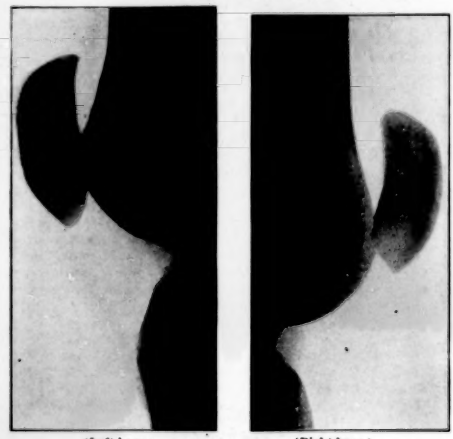
One or two additional chromicized sutures of somewhat smaller size are used to repair the extensions of the rents in the lateral ligaments, and the aponeurotic tissues in front of the patella are united with a few fine catgut stitches, the point being not to introduce any more sutures that are not readily absorbable than are absolutely necessary (Fig 2).

The cutaneous wound is closed with silkworm gut without drainage.

The whole procedure should not occupy more than fifteen minutes.

The advantages of the method are its simplicity and ease, the avoidance of prolonged manipulation and traumatism, which is unavoidable when the fragments are bored for sutures; the exertion of the lines of the restraining force in the most efficient direction; the absolute coaptation; use of absorbable sutures and its rapidity.

In regard to the last point, I think that it is generally conceded that with the present perfection of aseptic technic as regards instruments and gloves, infection occurs almost in direct proportion to the length of the operation and the consequent traumatism of the tissues.



(Left knee.) (Right knee.)

Fig. 4.—T. B., male, age 19. Fracture left patella junction lower one-third and upper two-thirds. Tear later ligaments ¾ inch on each side. X-ray 2½ years after operation. Union and function perfect.

The after-treatment is the usual one. A molded plaster splint is put on, which is removed daily for massage after the fifteenth to the twentieth day.

In regard to the time for operation, I consider it is well to operate as soon as is convenient after the injury. I do not wait for the effusion to subside. In fact, I think it a distinct disadvantage to delay operation over four or five days, since after that time the tissues begin to heal in abnormal relationship, and the difficulty in properly coapting them is thereby increased. Also by then, the fibrous fringes become attached to the surfaces of the fracture and fresh hemorrhage is provoked in separating them.

RESULTS.

I have used this method exclusively for three years, and during that time have sutured by it twenty-two fractures of the patella, two of them being refractures. Of these cases two have been done so recently that the result as regards bony union is still undetermined. In the remaining twenty, bony union was obtained. There have been no infections, the wounds healing in all *per primam*.

In regard to the restoration of function. Some have passed from observation before the motions of the knee were absolutely free, but in all the cases that I have been able to trace, three months after operation the motions of the knee have been perfect, with one exception to be mentioned later. In the earlier cases I was not so particular in instituting early massage, and some of these cases were left in splints for six weeks; consequently, the motions of the joint were limited for longer periods than would otherwise have been the case.

Two patients refractured their patellæ. One of these was a laborer, 39 years of age. The original fracture was by indirect violence, and was accompanied by considerable separation and tearing of the lateral patella ligaments. The fracture was a clean transverse break. Two months after the operation, while walking, he slipped on some ice and refractured it. He immediately reapplied for operation. At the operation the surfaces of the break were found to be as rough and sharp and bleeding as freely as when first fractured, and there was not the slighest evidence of fibrous union. Furthermore, there had been a considerable formation of new bone on the sides of the patella at the ends of the original line of fracture. Union had been bony, but the time elapsed (two months) since the first fracture had probably not been sufficient for the new bone to become as dense as it would have later. The second operation resulted in good union, but there was a great deal of thickening of the soft tissues and considerable stiffness remaining when the patient passed from observation some three months afterward.

The other case was a negress, 35 years of age. The original fracture was a transverse one, with tilting of the lower fragment, so that its fractured surface was directed forward. There was considerable separation. The result of the first operation was perfect as regards union and function. Seven months later she fell and refractured it. At the operation I was at first unable to determine whether the fracture was at the site of the original one or not, the surfaces were so sharp and rough. Finally, I noticed that the fractured margin of the articular cartilage was somewhat rounded, showing that the line of the second fracture coincided with that of the first. The result of the second operation was excellent. Figure 3 is from a radiograph taken thirty-five days after operation.

In these cases there was no evidence at the second operation of there having been any interference with the circulation in the fragments as a result of the original procedure. In fact, in one of them there was considerable proliferation of new bone at the sides of the patella at the points where the greatest stress from the sutures was exerted. In some of the cases in which there was comminution of the fragments there has been a marked production of new bone during the process of repair, thus adding considerably to the size of the patella. This is evident in the accompanying radiograph (Fig. 4).

In the preparation of this paper I endeavored to get radiographs of as many of the cases as possible. Although I heard from many of the cases I could only get six to come for radiographs. In all of these both knees were taken, and the comparisons of the patellæ were interesting, particularly in regard to the enlargement of the bone as a result of comminution.

DISCUSSION.

Dr. John H. Gibbons, Philadelphia—The improved technic added to our knowledge of the pathology of fractures of the patella have gradually increased the indications for operation on this condition. One supposed contraindication to operation is age, but the excellent result I recently obtained in a man over 60, operated on ten weeks after fracture, convinces me that age alone is no longer a contraindication. I showed this case at the Academy of Surgery recently and demonstrated a perfect restoration of function. There is one contraindication to which we should always give consideration, and that is alcoholism. Delirium tremens is a common and serious complication in fractures. The incision is an important point. The old straight incision should be relegated to the past and Dr. Blake's curved incision extending just below the line of fracture is much to be preferred to the straight one. With the straight incision you can not satisfactorily perform the operation as it is impossible to get at the lateral ligaments. I use a horseshoe-shaped incision for all operations on the patella and its bursæ. The question of sutures should be referred to and I do not believe that wire is required for the satisfactory union of this fracture. I agree with Dr. Blake that the absorbable suture is the better. We will get practically as good results by suturing only the tendon as by suturing the bone. The avoidance of rough handling of the tissue is important, as traumatism of this character is more apt to result in infection than probably any other one thing. Early massage is an essential in the after-treatment. We are apt to keep the limb quiet too long. We can make the mistake, however, of giving massage and movements too early, as I did in one of my cases. The man was out of bed at the end of two weeks. The result was only some swelling and ultimately the limb was just as useful as in other cases. I want to lay stress on the fact that massage is an essential part of the after-treatment.

Dr. G. T. Vaughan, Washington, D. C.—The incision depends on the case. For recent cases I believe the horseshoe or transverse incision is better, but in old cases, with a good deal of separation of the fragments, the longitudinal incision is better. The transverse incision can be reinforced if necessary, but a long longitudinal incision is the better. This method of uniting the lateral ligaments has been usually done in fractures of the patella. I always unite the lateral ligaments when they are lacerated. I have seen cases where there was very little laceration of the ligaments, as in fractures from direct violence. As to the suture, at first I thought it was almost inexcusable to put silver wire into the knee cap, but I have had good results follow the use both of kangaroo tendon and catgut. I have also seen some bad results, but they were not my cases. Sometimes the animal suture gives way too early, and recently I have been using silver wire on this account. To get patients up early the fragments should be fastened together with silver wire, though, as a surgical principle and as a rule I do not approve of the non-absorbable suture. The old cases sometimes give trouble when there is a great deal of separation. I would like to know the best way to get the fragments together. I have used two methods, one of which was to split the tendon of the quadriceps down, cutting across on opposite sides above and below, and the other was to make an oblique cut across it and slide it down. Both of these have been followed by good results, and I have had no particular weakening of the quadriceps extensor. I have had 19 cases altogether of operation for fracture of the patella. In one of the earliest I used the old Barker method and got a fibrous union. Bony union resulted in all the other cases. I had one patient with a refracture of the patella, the fracture occurring at a different site, one-third of an inch above the original fracture.

Dr. C. O. Thienhaus, Milwaukee—In April of this year I operated on a man who fractured his patella two years ago in South Africa. After having been confined in the hospital at Rhodesia and having been treated by conservative non-operative methods for nine weeks, he left the hospital with an apparatus without union. When I saw him the distance of the fragments was about 15 cm., his leg almost useless, the condition having grown worse within the last year, and he was unable to extend his leg when it was flexed. The difficulty of getting the fragments together in such cases is very often enormous and different methods of lengthening the rectus femoris muscle have been proposed. Some years ago von Bergmann advised chiseling off the tuberosity of the tibia with a wide chisel. Thereby the inferior fragment is made movable and later heals higher up. In many cases this method alone has proven sufficient to get the fragments together, but this was not possible in my case. I, therefore, combined this method with one of the methods of lengthening the rectus femoris, that is, by a Z-shaped incision through the muscle. After this I succeeded in getting the fragments together and wired them with three silver wires, one of which was removed four weeks after operation. The result has been satisfactory; bony union was obtained. He walked without the aid of a cane eight weeks after the operation. There is still some stiffness in the joint which must naturally be overcome by bending the knee gradually to avoid a refracture.

Dr. J. F. Binnie, Kansas City, Mo.—I do not think bony union is of very much importance. Thoroughly good fibrous union between the fragments seems to give every bit as good functional results as is possible. I have never yet wired the patella simply because by following a method similar to Dr. Blake's and getting free exposure of the lateral ligament, I have gotten just as good results. There is no use bothering with wire. I would strongly advise, 1, early operation before there has been time for marked changes to take place in the tissue, and 2, thorough operation and suturing of the lateral ligament. I use catgut, either plain or very mildly chromicized. I very much dislike strongly chromicized catgut.

Dr. D. N. Eisendrath, Chicago—I was obliged to resort to a similar method to that described by Dr. Blake about one year ago in a case of fracture of the patella. The operation was performed twenty-four hours after the injury, and my original intention was to drill the upper and lower fragments respectively, and unite them by means of a kangaroo tendon. Unfortunately, just at the moment when most needed, the drill failed to act, and I was obliged to utilize simply the periosteum covering the anterior surface of the patella in order to get a basis of support for my sutures. I used one kangaroo tendon over the center of the patella, inserted in a mattress fashion, and was very careful to turn outward the edges of the periosteum at the line of fracture believing that this turning in of the periosteum, thus separating the bony edges, will often prevent good union. I fully indorse the point made by Dr. Blake as to the necessity of inserting sutures through the aponeurosis of the quadriceps lateral to the break in the patella, because the fracture of the patella is almost invariably accompanied by a more or less severe laceration of the aponeurosis. I agree that fractures of the patella should not be operated on unless the most aseptic conditions prevail. The early use of massage to overcome the atrophy of the quadriceps is of the greatest importance.

Dr. J. B. Bullitt, Louisville, Ky.—The phase of the subject presented by Dr. Blake has not had the wide recognition that it deserves, and it seems to me that we should change the nomenclature. Instead of sticking to "fracture of the patella" we should say "rupture of the lateral ligaments" of the patella. The attention of the surgeon has always been directed rather to the broken bone than to the ruptured ligaments. We should keep our attention confined to the latter. Dr. Binnie says that he does not give any attention to the fracture of the patella, and he is about right. It has been demonstrated that the patella is not essential and that a perfectly strong joint can be had without it. The separation of the fragments with non-union and the resulting disability has ofttimes led to the impression that it was the non-union which led to the disability, whereas it was simply the lengthening that caused the trouble. I am glad to report that success in this operation has no geographical limitations south of Mason and Dixon's line just as north of it. I have operated on three patellæ in two cases and have obtained quite satisfactory results. As to the time elapsing before operation, Dr. Blake says that four or

five days is all that is necessary, and that further time is really a disadvantage; but this is not in accord with the teaching of some of our best surgeons. Some of them have told me that it is much safer to let the cases go ten or twelve days before operation. Probably the danger of infection is less by waiting and the injured tissues are in better shape to take care of themselves. The delicacy of the technic of the operator will necessarily bear some relationship to the time at which he might operate. If a man knows exactly how to manipulate tissues he might venture to operate at an earlier time than a less skilled man. For most surgeons it would be better to wait longer. As to the necessity of keeping the fingers out of these wounds, this can not be too strongly dweit on. Our chairman advised years ago that we keep our fingers out of wounds of this nature. Most of you are familiar with his work on this subject, and I am sure we should all like to hear from him.

DR. C. H. LEMON, Milwaukee, Wis.—The increasing speed at which street railways are operated is increasing the number of these cases. The operation described by Dr. Blake requires little or no handling of the tissues, which is one of the most important features in an attempt at operation in these cases. I say "attempt" because I wish to raise my voice in warning, by calling your attention to the fact that many of the cases operated on have not had the excellent results reported by Dr. Blake. Occasionally a man riding on a car will lose his hat and jump off before the car stops. We had such a case in Milwaukee where the man fractured both patellæ. I do not believe the man lives who should attempt to operate on both patellæ at the same time. I have in mind just such a case and as both suppurated the man's condition was pitiable. The advantage of the operation in young men is that it shortens the disability. If a fracture of the patella is treated by the old plan it will take six months, but if an operation is done as described by Dr. Blake he may go back to work in eight weeks.

DR. CHARLES A. POWERS, Denver—Some years ago I made a report to the American Surgical Association on the question of operation in recent fractures of the patella. I approached the subject with a decided opinion that operation was unwise, but after thorough study I was convinced that it has a very legitimate place in surgery. Where there is no contraindication operation is not only permissible but advisable. Dr. Blake's paper adduces splendid results and I am impressed by his method of local suture. We all indorse Dr. Lemon when he says that the operation of suturing a broken patella demands perfection in aseptic technic.

DR. JOSEPH A. BLAKE—I purposely did not include the treatment of old fractures in my paper and consequently did not mention the cases I have treated. The method I have used is not new, since the treatment of these cases by suture of the lateral ligaments has been done for some time, although the chief reliance has been placed on the sutures in the capsule in front of the patella. My only possible claim for originality exists in my contention that suture of the lateral ligaments is alone sufficient, and in the method of introduction of the sutures. The sutures must be introduced very closely to the sides of the fragments in order to hold them firmly and prevent them from moving laterally on each other. The sutures should actually grasp the bone, as shown in the drawings. As to the suture material, its nature is largely a matter of preference. I have always made sure that it was sterile and then have felt safe. In most of my work on fractures in the neighborhood of joints I use a very mildly chromicized catgut. I prefer the chromicized to the plain, as the plain catgut soon becomes soft and its surface slimy. The chromicized gut does not become slimy and does not untie. In order to make a plain catgut suture knot hold we must put a large amount of foreign material into the wound by having to tie it many times. In chromicized gut this is not the case. If the gut is chromicized too much we then introduce a substance which is worse than silver wire, because we not only have a non-absorbable material, but we have in addition a chemical irritant. As to the time for operation when I have operated about a week after the injury, in many cases I have found that attempts at repair had already taken place, and I have had to cut away granulation tissue extensively in order to oppose fresh surfaces. I now operate as soon as possible after the case comes into the hospital. I like to have twenty-four hours' preparation, and as a number of these cases do not apply until twenty-four hours after the injury, two days usually intervene between the accident and the operation. It is better to operate early than late, although I have not observed any great difference in the results except that repair is more rapid in early operations. In the suturing of an old fracture, of any bone, the repair is not nearly so rapid as it is after a fresh fracture. Union is often delayed for double the period in old fractures as compared with fresh ones.

THE ETIOLOGY OF HAY FEVER.

THE RELATION OF THE CHEMISTRY OF THE SALIVA AND THE NASAL SECRETIONS TO DISEASES OF THE MUCOUS MEMBRANE OF THE MOUTH AND UPPER RESPIRATORY TRACT.*

D. BRADEN KYLE, M.D.
PHILADELPHIA.

While this paper has special reference to the etiology of hay fever, it is necessary to go into the chemistry and pathology of the saliva and nasal secretions before taking up the special subject. In doing this, I take the liberty of quoting from my previous papers on the subject.

In the chemic study of the nasal and salivary secretions we may conveniently classify them under three varieties: First, secretions, non-irritating *per se*, which on exposure (when coming to the surface) undergo some chemic change producing an irritant; this may be noted in either an acid or alkaline secretion. As I will show later, an exceedingly alkaline secretion is decidedly more irritating and productive of a more destructive pathologic process than even a strongly acid secretion. Second, secretions which are irritating *per se* when poured out on the surface. Third, secretions which come to the surface in a non-irritating form, but on coming in contact with extraneous material are rendered irritant.

Two great principles which have been satisfactorily demonstrated are these: In highly alkaline conditions there is an exaggerated oxidation process and the chemic change takes place in the secretion after it is poured out. This is of the greatest importance in nasal, laryngeal and pharyngeal lesions, and is also of immense significance in pathologic changes in the gums and about the teeth, as highly alkaline secretions will cause external irritation more quickly than an acid secretion. In highly acid conditions the oxidation process is incomplete, hence there is a greater tendency to precipitation of material within the tissue, with the necessary pathologic alteration—an infiltration process.

Michaels[1] of Paris was the first, I believe, to call attention to this subject, not in medicine, but in relation to dentistry. Kirk of Philadelphia has also taken up the investigation.

For the chemical formulæ employed in the laboratory investigations reference may be made to Michaels' article, as they are practically the same as my own.

Naturally it was necessary to investigate the histochemistry of a normal secretion, concerning which subject the literature is very meager, before taking up its pathologic or chemic changes. The saliva is the mixed

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Laryngology and Otology, and approved for publication by the Executive Committee: Drs. G. Hudson Makuen, George L. Richards and John F. Barnhill.

1. International Dental Congress, Aug. 9, 1900.

secretion of the parotid, submaxillary and sublingual glands, and the small mucous glands of the mouth. Physiologically, three kinds of secretion may be distinguished—a serous, from the parotid gland; a mucous, from the mucous glands, and a mixed secretion, from the submaxillary and sublingual glands. Mixed saliva is opalescent, tasteless, generally alkaline, and has a specific gravity of 1,004 to 1,009. Saliva contains serum albumin, globulin, mucin, urea, an amylolytic ferment called ptyalin, and a proteolytic and lipolytic ferment; also salts, the most important of which are ammonium, sodium and potassium and the sulphocyanid combinations derived especially from the parotid gland. The nasal secretion is practically the same as the salivary.

The ammonium salts and sulphocyanids in healthy saliva are in equal proportion and in very small quantities; in the hypoacid condition the ammonium salt exists in greater quantities than the sulphocyanid, and tends to rapid decomposition, and changes quickly when poured out on the surface. In the hyperacid condition the sulphocyanid is in excess, although it may be present in the hypoacid conditions, and the tendency to decomposition is not so great as in the hypoacid condition until exposed to moisture or air, and the chemic action has caused alteration of the compound.

In hyperacid conditions the sulphocyanids are in greater proportion than the ammonium salts, and the secretion is less irritating, while in the hypoacid state the ammonium salts are in excess of the sulphocyanids and the secretion is decidedly irritating, and in many cases in which I have been able to examine the secretions, especially of hay fever patients, this hypoacid condition has existed.

My studies of the saliva have been very much in the same chemic line as Michaels'. First, the study of the normal healthy saliva; second, the saliva from hypoacid individuals; third, the hyperacid condition. To this I have added the neutral or irregular cases, which are neither normal, hyperacid, nor hypoacid.

From my investigations, I found that the reaction of the salivary and nasal secretions as given by the ordinary litmus test was often faulty and misleading, that owing to chemic changes which had taken place after the secretion is poured out on the surface of the membrane the reaction of the secretion changed. This was of the greatest importance from the standpoint of treatment, as the reaction might show precisely the opposite of what existed in the secretion as it came from the gland proper. This has been verified by Kirk of Philadelphia, who has shown by his investigations that the neutral sodium phosphate is frequently present. This may be the cause of much confusion in testing the chemic reaction. This is especially true in the hypoacid conditions. Kirk also agrees with Michaels that the polariscope is of the greatest value, and a direct aid in the chemic study of these secretions. He has also shown, to quote his own words, that

> The neutral sodium phosphate occurring so abundantly in the hypoacid conditions has been put down in earlier works as ammonium chlorid. The appearance of the two compounds is very similar until a special study has been made of them. However, the so-called neutral sodium phosphate is really alkaline, and the alkalinity of the normal saliva may be measured in terms of sodium phosphate, with sodium carbonate and bicarbonate. Both are found in normal and hypoacid saliva, but in different amounts.
>
> When we came to the hyperacid individual we had an entirely different aspect. Here we had an individual producing large quantities of CO_2, more rapidly than it can be eliminated, the excess being dammed up in the plasma of the blood, existing as H_2CO_3. The normal reaction by which this over-acidity is taken care of by the renal epithelium is $H_2CO_3 + HNa_2PO_4 = H_2NaPO_4 + HNaCO_3$, but when the conditions are such as to produce larger quantities of carbonic acid than the kidneys can eliminate all sodium acid phosphate, other epiblastic structures take on the same action and there is a higher acidity of the saliva as well as the urine. A curious chemic feature of this matter is that the acid sodium phosphate and the neutral sodium phosphate might exist in the same solution without neutralizing each other, giving a solution that would turn blue litmus paper red and red litmus paper blue, the so-called amphoteric reaction.

The appearance of the lactophosphate of calcium in the saliva and urine indicates certain diseases of the liver. Dr. Kirk has been led to this conclusion from reading the researches of Minkowski, who found, in a series of experiments on geese, where he had removed the liver, that they then excreted, instead of uric acid and the urates, the ammonium lactate, and he deduced from these experiments that one of the functions of the liver was to convert ammonium lactate into urates, as the appearance of lactates in excessive amounts in the excretions, especially the urine, is indicative of a disordered liver function.

The condition of neutral, hypoacid and hyperacid conditions can best be illustrated by cases The excessively alkaline condition is observed more frequently in hay fever, although either one of the three, the hypoacid, the hyperacid or the neutral condition may exist.

STRONGLY ALKALINE CONDITIONS.

The following case illustrates this condition:

> Dr. B., who had been suffering from an irritating, rasping cough since September, 1902, was referred to me in January for an examination of his throat. The symptoms presented were principally the cough, with hyperemic and irritated mucous membranes, though the congestion and swelling were not in proportion to the severity of the cough. The cough was persistently spasmodic, almost resembling paroxysms of whooping-cough, except more often repeated. There was decided hoarseness and congestion of the vocal cords. The chest examination was negative, with the exception of slight bronchial rales. Here and there on the mucous membrane were small hemorrhagic spots, which I believe had been produced by the violent irritation caused by the spasmodic cough.
>
> *Examination of Saliva.*—The saliva was found to be hypoacid, the ammonium salts being in excess, and when the secretion came to the surface there was liberated free ammonia gas, which was in sufficient quantity to produce the irritation.
>
> *Treatment.*—On this basis the treatment was administered, all the organs of elimination were stimulated, and the chemistry of the secretion was changed to acid or neutral reaction, following which change the cough disappeared within a few days, the irritation rapidly subsided, and in ten days all inflammation had disappeared with the exception of some slight localized areas, which probably had been brought about by the persistent coughing, and these areas rapidly yielded to local treatment.

In so many cases in which the objective symptoms were in excess of that which the local lesion would justify, I have found that the irritation was brought about by some altered chemistry of the secretion, and that the local lesion was merely a manifestation and result of this alteration.

To review the chemistry, ammonium is a hypothetical alkaline base, having the composition of NH_4; it does occur in a free state, however, in the form of ammonia gas, NH_3, the inhalation of which is very irritating to the mucous membrane and causes suffocation and edema of the glottis. As the ammonium salts usu-

ally exist in combination with other materials, is it not likely, in certain conditions in which the secretions are hypoacid, that when the secretion comes to the surface of the mucous membrane, owing to its chemic combination with oxygen, there is liberated NH_3, the irritating ammonia gas? Surely the symptoms, identical with those produced by ammonia gas, in many cases justify this conclusion, and the chemic study of the secretions supports this view.

Many cases of hay fever illustrate this point, although in hay fever the nasal secretions may be either hypoacid, hyperacid or neutral, or irregular.

ETIOLOGY.

The numerous theories as to the etiologic factor in this disease prove conclusively that as yet there has not been established a definite cause. It may be that different conditions act as etiologic factors; in fact, it is my belief that not all cases which we call hay fever, or hyperesthetic rhinitis, are due to any one cause; or, if to any one factor, that factor must be the altered chemistry of the secretions of the individual. In fact, I am persuaded, after making a series of examinations of the saliva in certain individuals afflicted with hay fever and those not so afflicted, that in some cases the causes, direct or indirect, of local irritation in the nasal mucous membrane are brought about by chemic change in the constituents of the secretions of the mucus-secreting glands. Treatment based on this view is certainly most effective. Sensitive areas within the nasal cavities, or irregularities in formation of the cavities themselves, are factors in some cases, yet such areas or irregularities, instead of being etiologic, are merely auxiliary factors, which render the individual more susceptible to the irritant from within.

It is a well-known fact that in many cases of hay fever the irritation is not limited to the nasal mucous membrane; the conjunctival, buccal, pharyngeal and laryngeal mucous membrane, and even that of the stomach and bladder, may be markedly involved. This could scarcely be explained on the basis of a reflex neurosis. In such cases the mucous membrane suddenly becomes engorged, and is exceedingly sensitive, with profuse, watery, irritating discharge This comes on suddenly, often without any apparent external irritant, and at times looks very much as though there was an effort on the part of the mucous membrane to rid the system of material which had just reached a certain point of accumulation.

The question may be asked: Why does hay fever come on at certain times of the year? That climatic and atmospheric conditions produce changes in function and secretion, that certain diseases are prevalent at certain times of the year, and that under certain climatic and atmospheric changes individuals are more susceptible to disease, has long been observed. This may be due to some condition of the individual which renders him susceptible to disease, owing to lowered cell resistance and altered chemistry, since temperature and climatic changes do affect the chemistry of the secretions. As to the effect of pollen in certain cases, is it not possible that, owing to some peculiar constituent of the secretion of the mucous gland, there is deposited in or on the nasal mucous membrane certain materials which, when brought in contact with certain extraneous materials as pollen, through some chemic action, produces a material which brings about the irritation and causes an attack of what is known as hay fever; or that the extraneous material merely acts as a stimulant to the mucous glands and causes a flow of mucus, which, owing to its altered chemistry, acts as an irritant?

This is exemplified in the cases in which the ammonium salts bring on an attack identical with that produced by the rag-weed pollen. If the administration of the tincture of rag-weed produced immunization to hay fever, it must do it through the secretory function, and the chemistry of the secretions would be such as to contain no materials which, when coming in contact with the pollen of the plant, would produce any irritating substance. I have seen cases illustrating this point.

There is no question that the irritation is caused by some product of chemic action. The question involves organic chemistry, and any one familiar with the wo l recognizes the time and labor necessary to work out such chemic formulæ. I have, however, done sufficient laboratory work in the past eight years to convince me that on this basis we can relieve many cases of hay fever. That the chemistry of the secretions has to do with the causal factor, I have illustrated in a number of cases by rapidly changing the reaction of the secretion either from acid to alkaline or from alkaline to acid, or rendering it neutral, and in many instances I have been able, either partially or wholly, to cure the attack.

Certain individuals will have, at any time in the year, an attack which is quite similar to hay fever. The individual may be sitting comfortably at home, subject to no draughts or exposure whatever, when he is suddenly seized with congestion of the nostril, followed rapidly by the thin watery discharge of a decidedly irritating nature, free lacrimation, with burning and itching in the nasal cavities, eyes and nasopharynx. Frequently associated with this is a slightly asthmatic tendency It can not be cold; it is something in the nasal secretion, and when the secretion comes to the surface and in contact with the air there is liberated some material (chemic) which acts as an irritant to the vasomotor system (peripheral terminal nerve filaments) and causes sudden congestion. Such attacks are quite like inhaling ammonia fumes, and in such cases there is present an excess of ammonium salts in the saliva. Owing to some chemic change in the secretions of the individual there is accumulated material within the system, which in the point of accumulation reaches that period in which it overflows, and the secreting glands liberate on the surface this material, which when exposed to the air undergoes a chemic change. In many instances, on examination of the saliva and the nasal secretions there has been found an excess of the sulphocyanids and the ammonium salts. When this secretion is exposed to the air, free ammonia is liberated, which I believe to be in many cases the cause of the attack. The symptoms produced are identical with those of the inhalation of ammonia fumes. When the secretion is exceedingly alkaline the patient will often have symptoms identical with those of articular rheumatism.

CASES IN WHICH THE SECRETIONS ARE HYPERACID.

The following case is an illustration:

Mr. C., aged 42, consulted me in regard to what he supposed to be a catarrhal condition, associated with ozena. His breath was most offensive, but, although pronouncedly so, it was not the penetrating, clinging odor observed in atrophic rhinitis with ozena. He had observed the condition rather suddenly, and it had existed continuously for some four or five years. His history was absolutely negative as to any catarrhal condition other than an occasional cold. He had consulted specialists both in this country and abroad, not only as to the possibility of the odor coming from the nose or some of the accessory cavities, but had also consulted specialists on dis-

eases of the stomach, as well as having had a thorough inspection of all his teeth. He had been told that he had practically no catarrh, and, as his digestion was good and nothing found wrong by analysis of the contents of the stomach, it was quite puzzling as to the source of this odor. After a thorough examination, and knowing that the men under whose care he had been were most thorough and competent in their line, I reasoned that there must be some source of the disagreeable odor outside of the parts already mentioned. As this was in the winter of 1895, and as my attention had been called to the importance of the secretions by other conditions, as well as a statement made to me by the patient, I decided to investigate the saliva. The statement which he made to me, which was most significant, was this: "That, while his appetite was very good, and when his olfactory nerve was stimulated by the odor of a delicious meal, causing his mouth to water, the disagreeable odor and taste became so pronounced as to almost nauseate him." I then collected some of the saliva. The method used for its collection I learned from my experience in a dentist's chair, that while sitting with your mouth wide open for a few minutes you have a most profuse flow of saliva. This method, practiced just before meal time, enabled the collection of quite a large amount of the secretion. The offensiveness of the secretion was at once detected.

CHEMISTRY OF THE SULPHOCYANIDS.

In order to explain the chemic source of the offensive odor it is necessary to take up the chemistry of the sulphocyanids. As to the sulphocyanids which are present in the saliva, it is a chemic fact that most of the cyanids are actively poisonous and that a cyanid is formed, or is a compound, of cyanogen with a metal or radical. A sulphocyanid is a salt in which sulphur takes the place of oxygen in the acid radical. Cyanogen is a radical molecule having the structure CN, an acid compound of carbon and nitrogen. A radical is a group of atoms having unsatisfied valency, an unsatisfied molecule which goes into or out of combination without change to itself and which determines the character of compounds. A sulphocyanid is a combination, then, denoting the chemic combination of sulphur with a radical When a sulphocyanid is eliminated the secretion in which the ammonium salts are in excess is alkaline, but when it comes in contact with the air, owing to the chemic change which takes place, it becomes an acid radical. Hence in many instances in which from our test we believe the secretion to be acid, it is really hypoacid (alkaline). This is most important, and in many instances in which from the test reaction we are led to conclude the reaction to be acid, it is in reality in the system an alkaline reaction, and only becomes acid when, owing to chemic action due to exposure to air, certain materials are eliminated and the reaction changed. In some of the sulphocyanid combinations in which we get the bad odor, as illustrated in the above case, the chemic change causing such odor is as follows: Sulphur itself is an acid element, which unites with oxygen to form an acid radical, but in a sulphosalt the sulphur takes the place of the oxygen in the acid radical. The sulphocyanid itself would be a sulphosalt in which, in combination, the sulphur would take the place of the oxygen and give off sulphuretted hydrogen. In a sulphosalt the sulphur takes the place of the oxygen in combination to form an acid. A sulphocyanid is a sulphosalt, and when the sulphocyanid is in excess, when liberated and coming in contact with the secretion which contains moisture (H_2O), the sulphur would unite with the hydrogen, giving off free oxygen, and form hydrogen sulphid. A radical is a group of atoms having an unsatisfied valency, and is really unsatisfied molecules which go into or out of combination. It is possible, then, to have in a hyperacid condition many chemic combinations take place. This chemic result surely verified the olfactory diagnosis in this case.

CASES NEITHER HYPOACID NOR HYPERACID.

That cell nutrition depends on the chemistry of its supply is illustrated in disease processes associated with any form of infection or rise of temperature. This opens up an enormous field for speculation and investigation. The amount of infection, the peculiar chemic change produced by temperature, the materials absorbed into the body from infective processes, or the autoinfection from the intestinal tract, would in each condition produce its own peculiar chemic compound. Yet I believe a general basis can be reached, at least sufficiently accurate, from which to draw chemic and clinical deductions

For example of peculiar effect on various structures in the body brought about by an altered chemistry in which the secretions may be neutral or irregular, I will quote from an article which was published in *American Medicine*, Feb. 8, 1902, in which I reported a number of cases of enlargement of the thyroid gland in which the cellular elements of the thyroid structure were increased, the enlargement not being due to distended vessels, cystic condition of the gland, or new growth.

I reasoned the matter out as follows: It is a well-known physiologic and therapeutic fact that certain drugs have a selective action on certain tissues or organs of the body, e. g., belladonna, with its selective action on the pharyngeal surface; sodium phosphate, with its selective action on the liver, etc. It is also a physiologic fact that the normal chemistry of the body controls the normal secretions from the various secretory organs, that any perversion from the normal necessarily alters the character and chemistry of the secretion, and that the products of such alteration act as irritants to certain parts of the body; the difference between this and drugs administered is that one is introduced into the body and one is manufactured within the body. I, therefore, reasoned that under certain conditions there is precipitated —due to perverted chemic reaction—a certain material which, circulating through the blood, had a selective action on certain tissues; in the cases observed such selective action occurred in the thyroid gland, acting as an irritant to that gland. While the treatment of these cases reported was somewhat theoretical, I believe, however, that the drug introduced into the body, by its chemic action, altered the chemistry of the material which was acting as an irritant, either rendering that irritating material inert or forming a compound which was non-irritating.

In regard to the pathologic chemic process producing such reactions of the secretion, it is a well-known clinical and laboratory fact that a study of the products of the secreting organs, which in their excretory functions throw off waste material, gives us by deduction a fair idea of what process is going on within the body. Yet this excretory secretion or material is altered in its chemic composition and controlled by the chemic constituents within the body proper.

There is no question that under certain conditions—for example, when the secretions are acid or alkaline—the chemic process taking place within the various secretory glands must vary, and the product of such variation in these unknown quantities must be somewhat the same as the variations we would obtain in dealing in the laboratory with known compounds. In other words, that the body is largely a chemic laboratory, having on hand

a certain amount of material and having added to it daily ingredients through the respiratory and alimentary tract. Now, any perverted conditon from what is known as the normal chemistry may bring about a series of changes and produce chemic products which may be harmless or productive of disease processes. On no other basis can we explain the various diatheses and the precipitation of certain materials in the tissues of the body.

The altered chemistry of the saliva presents many possibilities from an etiologic standpoint. Many forms of lesions of the mucous membrane of the nose, nasopharynx, larynx, mouth and gums, as well as diseases of the stomach and intestines, may be brought about by the altered chemistry of the saliva. A great many morbid processes are traced to uric acid in some of its many forms, but I believe that many other substances, especially hyperacid conditions, equally important are deposited and eliminated, which substances act as irritants, producing apparent local lesions. It is a well-known clinical fact that saliva from certain individuals is exceedingly poisonous, as is indicated by the infectious wounds produced by the bite of such individuals, showing that the saliva may be the site of poisonous pathologic, as well as physiologic, compounds. This is especialy true in the sulphocyanid cases.

Unquestionably the chemic reaction of the secretions of the body is an important factor in the susceptibility of individuals to disease. I think there is no doubt that the fact that at one time the individual resists disease and at another time succumbs can be largely explained on this basis. To be sure, it is a question of resistance on the part of the individual, but that resistance is largely controlled by the chemistry of the cell or secretion. It also demonstrates the fact of the accumulative phenomena of certain of the diseases, as is illustrated in uric acid diathesis, which Haig has described as the uric acid storm. There is no reason why these same phenomena could not occur as the result of the accumulation of other materials brought about by chemic changes which lessen oxidation and tend to precipitation and accumulation of various morbid products.

The administration of drugs for the relief of, for example, an infective process, probably affects such a process beneficially, owing to the fact that in its action it changes the chemistry of the secretions and blood constituents, thereby producing a chemic compound which either prevents the formation of infectious material or alters the nidus of infection to such an extent that it is not suitable for the growth of bacteria.

While my investigations are incomplete and fragmentary, I am convinced that from the study of the saliva we can determine to a great extent any variation in the chemistry of the body. As these various secreting glands receive from the blood the supply from which they elaborate certain chemic compounds, if an analysis were made of the composition of such secretions it would give a good index to the general condition of the individual, and while in many cases the deductions would have to be based on or associated with clinical observation, I have found them to be of immense value from a standpoint of diagnosis.

The fact that the reaction of the secretion may be apparently acid when there really is present an alkaline condition, explains to us many of the cases in which, from an acid basis, our treatment has failed. That such a condition may exist has been shown by Douin and Gautrelet in their studies of the blood; that the reaction of the plasma is really acid, and if waste products are not eliminated this acidity is increased. The secretions and excretions then also become of an acid reaction.

The irritating gases which form in the stomach and intestines and produce laryngeal and pharyngeal irritation, are the result of chemic changes in the intestinal secretion, and such chemic change in the secretion can be demonstrated by a study of the saliva. That autoinfections and chemic changes in intestinal secretions have a marked general effect on the individual is well known. Such material absorbed into the system will unquestionably alter the chemistry of all secreting glands, and the compounds formed by such alteration which affect the individual can only be determined by the study of organic chemistry. The asthmatic conditions which are not associated with any organic lesion, I believe can all be explained on this basis, and when treated accordingly can, in many instances, be relieved.

In examining the secretion and excretion of the body, we can obtain as good an index of the systemic condition of the individual by a study of the saliva as by a study of the urine; in the urine we have only an index of the waste material, while in the saliva we have products of elimination which return into the body to perform a physiologic process.

Another important factor to be worked out is the different chemic changes which take place in individuals suffering with so-called functional diseases and those suffering from organic or structural changes. In the functional we have a perverted chemistry, which may be brought about by many causes, such as faulty elimination, from the kidneys or liver, and perversion of secretion from the intestinal tract, autoinfection from the intestinal tract; also chemic changes of the secretion illustrated in mental tension from fright, worry and anger; while in the organic lesions we have to deal with a structural change in tissues, with retrograde metabolic changes, in which there is also associated inflammatory processes with their accompanying phenomena and physiologic and pathologic effect on the individual.

EFFECT OF CLIMATE AND ALTITUDE.

The effect of climate and altitude on hay-fever individuals is interesting from a number of standpoints. If the disease is distinctly a neurosis, why should the patient, as a rule, improve in a high, dry altitude, when such altitudes are decidedly irritating to a nervous individual? Why is it that an individual, after having hay fever for several years, will miss one season, or even two, having no treatment whatever? Personally, I think the answer lies in the individual, at least in a majority of cases, and that the secretions of such individuals having changed under certain conditions were non-irritating. The famous case of Mackenzie's, in which the artificial rose produced an attack of hay fever, surely is strong evidence in the line of neurotic origin. At the same time, in a nervous individual with a perverted nutrition and necessarily perverted secretion, any particle of dust or anything whatever that would stimulate the nasal mucous membrane would promote the flow of secretion, which secretion being decidedly irritating, would at once bring on an attack.

INDIVIDUAL VARIATIONS IN SUSCEPTIBILITY.

Another interesting fact is this: That in the cases which I have watched closely for the past eight years, the hay fever was no respector of persons as to weight; that some individuals who were stout had the worst form of hay fever, while others who were very thin had equally bad attacks.

V 4
190

I also noticed that in a number of such individuals, when the secretions were changed and irritation ceased in some of the stout cases, they lost flesh rapidly, one patient losing as much as 40 pounds, while the thinner individuals improved in weight. This led to a comparison of the chemic examination of the various individuals. The very thin individuals in 90 per cent of cases had an excess of sulphocyanids which, of course, was acting as an autotoxic infection, while in the excessively stout individuals the reaction of the secretion varied, usually neutral or acid, which, of course, predisposes or causes lessened oxidation and increase of fatty tissues. Also that in individuals with an excess of the sulphocyanids, the individual always has the appearance of an autotoxic infection, deranged digestion and intestinal tract, and with the relief of this condition always shows rapid improvement.

Is it not possible that certain pollens coming in contact with the nasal mucosa, thereby acting as stimulants, promote the flow of secretion, and when such secretion is poured out on the surface either, as I have stated before, as an irritating secretion or when combined with the pollen, a chemic change takes place and an irritating material is produced? Dunbar's inoculation theory surely proves this statement, and agrees exactly with what I have said as to the secretions. Under this class of cases would come the rose cold, the ragweed, the horse fever, hay fever, rye fever, etc. Think of the difficulty of procuring an antitoxin for horse fever! In all such cases I think that the secretion is the predisposing and the extraneous material or pollen is an associated factor.

As is shown by Dunbar, the inoculation method is not successful in all cases, which is easily understood, as the chemistry of the secretions in the various individuals are markedly different; so that instead of an antitoxin for exciting factor, use preventive measures by altering the secretion. My own experience surely justifies this statement. Unquestionably, certain individuals, owing to the low grade of their vitality and neurotic temperament, are more likely to be subjects of this disease than persons of healthy type; nevertheless, many individuals of most perfect physical condition are the worst sufferers from this peculiar and annoying disease, and while I do not wish to be understood or quoted as saying that all cases of hay fever can be cured on this basis, my own experience does show that between 80 per cent. and 90 per cent. of the cases can be relieved and cured. When I say cured, I mean in the same sense as you would speak of curing a cold, and most certainly if the condition of the secretion changes and the irritating material returns, if the individual is exposed to the same irritants, he most certainly would have another attack.

1517 Walnut Street.

DISCUSSION.

Dr. E. C. Kirk, Philadelphia—My interest in this matter originated with a paper read by Dr. Michaels in Paris in 1900; subsequently I spent some time with him in his laboratory and went over the subject in detail. I have been studying the changes in the saliva since that period, and have become convinced of the importance of the generalizations made by Michaels that the chemical composition varies quite constantly with certain pathologic states, especially in relation to faulty metabolism. My own studies have been largely confined to the pathologic conditions of the soft tissues of the oral cavity, especially of the retentive tissues of the teeth. The method of study suggested by Michaels, the use of the micro-polariscope, first made it possible to accurately know the chemistry of the saliva; it gives a means of analysis which is extremely delicate and is as accurate in qualitative test as the gravimetric method could be. With the use of the polariscope we can detect the salts by polarized light. It is quite true that a study of this subject tends to confirm the general views entertained regarding the etiology of gout and other similar conditions. We have in the arthritic subject a condition of insufficient oxidation with large quantities of carbon dioxid dammed up in the blood plasma. It is part of the function of the kidney epithelium to return sodium bicarbonate to the blood and eliminate the acid phosphates through the urine as a result of the mass action of carbonic acid on the basic phosphates of the blood plasma. When the condition becomes excessive and chronic, it causes the loss of enormous quantities of phosphorus resulting in phosphorus starvation, and during that period other waste products, irritative in character, manifest their presence. Prominent among these is oxalic acid. Oxaluria generally means a state expressed in the terms of calcium oxalate. Enormous quantities of sodium oxalate, however, make their presence felt about the time phosphatic starvation supervenes. The patients then become neurasthenic, and in that connection also we have certain local phenomena. I have watched the development of leucoplasia in the mouth and its subsequent degeneration into epithelioma. I am of the belief that there is a definite relation between the irritation which these waste products produce and the conditions of the naso-pharynx described by Dr. Kyle. I regard them as productive of direct irritation to the mucous surfaces, and that they may even stimulate the tissues to the formation of new growths.

Dr. Judson Daland, Philadelphia—A proper appreciation of the chemical causes of this affection indicates a plan of treatment which has given brilliant results. It is not at all improbable that certain spasmodic bronchial affections that are usually considered under the name of asthma may have a like cause and a study of the disease from this standpoint may yield similar therapeutic results. The profession has been gradually recognizing the importance of hyperacid conditions of the upper respiratory tract and mouth, but Dr. Kyle is to be complimented on drawing attention to direct poisonous inflammation of sulpho-cyanids and of the marked local irritating effects of hyperacid conditions which are frequently in association with ammonia compounds, and, at times, free ammonia. These observations are of importance to the general practitioner because of their prejudicial influence on the general health, and there can be little doubt that certain cases of general toxemia are due to this cause. On the other hand, I am inclined to believe there are certain cases of toxemia of intestinal origin, usually fecal, that play an etiologic rôle in the production of the morbid chemical state of the nasal secretions and saliva. If we remember that within a very few minutes after the taking of lithium, it can be discovered spectroscopically in the saliva, and that normally within eight minutes after the swallowing of a solution of iodid, iodin can be detected in this same secretion, we realize how rapidly is the diffusion of these soluble substances and how promptly the salivary glands excrete these substances which here have the peculiarity of again being swallowed to again be absorbed into the circulation. I shall in the future give especial attention to the chemistry of the saliva and nasal secretions, more especially in well-marked examples of auto-intoxication, nervous asthma, hay fever and neurasthenia.

Dr. E. Fletcher Ingals, Chicago—The paper recalls to my mind the remark of the professor of medicine when I was a student, who, when asked what he would do for a certain disease, replied that it would depend entirely on what was the matter. It is encouraging to find some men searching among the living for the causation of disease. Pathologists deal with the dead, and hence become therapeutic agnostics. In the past nearly all medicinal treatment has been empirical, but the kind of experimentation outlined in this paper is destined to do much to enable us to know for what reason we are giving our remedies. It is certainly unwise to continue to give medicines, the action of which we can not satisfactorily explain. The pathologic side of disease is of great importance, but we

should bear in mind the fact that over 90 per cent. of the physician's work is therapeutic in character, and that nine out of every ten sick people get well. Our aim should be to try to cure them more quickly, and it seems to me that the greatest work before the profession in the coming years is along the line of therapeutic research. In our hospitals we find bright, energetic internes, but quickly discover that they have little knowledge of therapeutics. In the large hospitals with which I am familiar nothing whatever has been gained in the way of therapeutics for the past twenty-five years. It is difficult for the older members of the profession to do research work, and the younger men have not been encouraged to undertake it in this line.

DR. W. H. F. FITZGERALD, Hartford, Conn.—I believe the position taken is correct that these conditions are due to irritative changes, basing my opinion on the history of twenty-four cases I have worked at myself during the past two years. There can be no question about the irritative effect on the lining membrane of the nose, and it really makes little difference where this area is located. In my opinion, it is due entirely to the fact that the individual in question does not use his nose. As a class, we do not know how to breathe, and just so long as we go on breathing through the mouth we are bound to have these irritated areas.

A man may go to a certain district and the irritating pollen or organism attacks a particular irritated area of the mucous membrane of the nose and produces the condition of hay fever. Of these twenty-four cases treated, I have had but one case return; I have heard from all of them, and they have stated that they have had no recurrence. This is due largely to the fact that they are now breathing as they never did before. I see that they breathe properly at night, for I plaster their mouths up during the night and make them exercise the nose during the day. In the treatment of these cases I have employed no therapeutic measures at all after obliterating the irritable areas. One of the worse cases I ever saw was that of a minister who was prostrated two or three days out of every week, and at one time for nine months continuously. He then lived in the west, and for the past three years has been living in the east, and his trouble was as great in one locality as in the other. I found he was a very bad breather, and I have succeeded in making a good breather out of him. He recovered entirely, and even went back to his former residence looking for trouble, but failed to find it.

Another case was that of a woman who used from forty to sixty handkerchiefs a day during a period of thirteen years. The condition was complicated during the thirteenth year with attacks of asthma which kept her awake most of the night. I removed obstructions, irritable areas, etc., and discharged her over a year ago. She has since been averaging not more than one handkerchief a day, and says that she has had but one slight attack of asthma in the course of the year. She states that she often had the feeling that if she took one breath through her mouth she would have another attack, and that under these circumstances she often resorted to the plaster during the day. Since she has become a normal breather this has not been necessary.

DR. W. S. ANDERSON, Detroit—Has Dr. Kyle made any study of the secretions of the pharynx in mycosis leptothrica? It runs a very stubborn course and occurs usually in healthy persons.

DR. J. HOLINGER, Chicago—There is a series of experiments which have a bearing on this subject of the chemical composition of the saliva and all the juices of the digestive tract with reference to the food taken. In experiments with dogs, it has been found that if a certain character of food is offered to the dog the saliva has characteristic changes, going very far in the direction spoken of. How can this series of experiments be brought into connection with the paper?

DR. G. V. WOOLLEN, Indianapolis—I have examined the statistics relating to the surgical treatment of these cases and have not been satisfied that they offered a definite solution of the problem. When Sajous' book came out, dealing with peculiar idiosyncrasies, external irritation, and diseased noses, we thought we had the solution in a definite form, but the idiosyncrasy suggested did not wholly satisfy me because this condition of the system is present at all times of the year. I then began, not chemically but clinically, to gather and observe these secretions. I have carried this investigation to an extreme degree ever since and am convinced that the secretions do not offer a solution of the whole matter. I also felt that if I could control the acid condition of the system I should have the key to the whole matter, but that was a disappointment. I am disappointed to-day. There has been a great deal said with reference to the mouth and pharynx, but these do not explain the conditions in the nose. As Dr. Ingals has intimated, the discussion is in the right direction and younger men will perhaps work out the problem along the chemical line.

DR. D. B. KYLE—Many of the points which have arisen in the discussion will be found answered in the remainder of the paper, all of which was not read on account of its length. I omitted to say that the chemical reaction of the saliva is so nearly the same as that of the nasal secretion that I did not use the terms nasal and salivary each time. In some cases, if tested at the same time, one will give an acid reaction and the other alkaline, but if the chemical composition is studied they will be found not to differ, the chemical reaction having changed after exposure to moisture and air.

As to mycosis, if it is a genuine case of mycosis and not keratosis, it is a well-known fact that bacteria grow better in alkaline media than in acid. I have made a careful examination in a few cases of pharyngeal mycosis and the secretion was alkaline in reaction.

POISONING BY WOOD ALCOHOL.

CASES OF DEATH AND BLINDNESS FROM COLUMBIAN SPIRITS AND OTHER METHYLATED PREPARATIONS.*

CASEY A. WOOD, M.D.
CHICAGO.
AND
FRANK BULLER, M.D.
MONTREAL.

With the kind assistance of the profession in the United States and Canada, we have been able to report the following instances of methyl alcohol intoxication, most of them hitherto unpublished.

The list of deaths and cases of blindness following the ingestion of "Columbian spirits" and other forms of wood alcohol, as well as methylated "Jamaica ginger," lemon "extract," "bay rum," "cologne water," "witch hazel," essence of peppermint, essence of lemon, etc., not to mention all sorts and kinds of other official, domestic and proprietary remedies into which alcohol enters, has lately grown to alarming proportions. This record of death and blindness has been made in recent years only, since the cheap, "deodorized" methyl alcohol [untaxed, retail price 50 cents a gallon; ethyl alcohol, taxed, retail price $2.60 a gallon] has been put on the market.

Wood alcohol and methylated spirits made by the old processes subserved useful as well as harmless purposes. They possessed practically all the solvent and other properties required for the various arts in which they were employed, and no one thought of drinking them or employing them as adulterants in foods or drugs. Indeed, so abhorrent to the organs of taste and smell was even a small percentage of wood spirit in any mixture, that no person in his senses would drink so nauseous a compound, however diluted and disguised, or however much he craved an alcoholic drink.

* Read at the Fifty-fifth Annual Session of the American Medical Association, in the Section on Ophthalmology, and approved for publication by the Executive Committee: Drs. Frank Allport, John E. Weeks and R. L. Randolph.

With the advent of preparations like "Columbian spirits," "colonial spirits," "eagle spirits," *et hoc genus omne*, the principal safeguard against poisoning by methylic alcohol has been removed. Some of these deodorized alcohols are with much difficulty distinguished by the laity from pure ethyl alcohol. Hence it is that in spite of ordinary precautions, such as labeling bottles of these preparations "not to be taken internally," they have been and are now, through accident and design, much used as substitutes for grain alcohol.

The appended histories by no means constitute a complete list of deaths and blindness from wood alcohol poisoning. A more careful canvass will, we are sure, bring to light numerous additional instances of this intoxication that we have not been able to gather during the limited time at our disposal. The remarks of Dr Moulton properly apply to many localities where grain alcohol beverages are difficult to procure:

Cases (of wood alcohol poisoning) are of frequent occurrence in Indian Territory, where the sale of ethyl alcohol is strictly prohibited by the United States government, so that those who crave stimulants drink anything they can get. I can safely say that in that country at least fifty deaths have occurred from this cause in the last few years.

The same remarks apply, though in a less degree, to methyl alcohol blindness. A circular letter on this subject was addressed by Dr. Wood to a large majority of the ophthalmic surgeons in the United States and Canada, and there is good reason to believe that, as a result of these inquiries, descriptions more or less complete of most of the well-defined and recent cases of wood alcohol amblyopia and amaurosis will be found in this report. At the same time, since blindness from methylated liquids was practically unknown until the recent introduction of this "purified" product, medical men may well be excused for not recognizing, for attributing to other causes or for afterward forgetting cases that several years ago came under their notice.

For purposes of subsequent reference we have divided these histories into four classes:

Class A.—Published cases of blindness or blindness followed by death, due to the drinking or inhalation of methyl alcohol. The cases comprised in Class A were collected, abstracted and tabulated by Dr. Buller.

Class B.—Cases (hitherto unpublished) of blindness or blindness followed by death from drinking methylated liquids.

Class C.—Cases (hitherto unpublished) of blindness from methyl alcohol absorbed through the lungs or skin, or both.

Class D.—Cases (hitherto unpublished) of death from methyl alcohol poisoning, without history of previous blindness.

The cases detailed under Classes B, C and D have been collected and edited by Dr. Wood. The sources of the information in the last three classes, arranged in alphabetical order, will be found at the head of each history.

SUMMARY OF PUBLISHED CASES.

The tabulated records (to appear later in this article) of 54 of the published cases show the ages of individuals to be from 21 to 65 years; mostly about middle life. Of 51 we note: Sex, males, 47; females, 4. Habits of life; 8 were, or had been, hard drinkers; 9 admitted occasional indulgence, 3 habitually temperate, 30 habits not stated, but no doubt most of them were more or less addicted to alcoholism. Six are reported to have used tobacco in excess, as well as alcohol. Occupations: Artistic painter, 1; attendant, 1; bricklayer, 1; barber, 1; carpenter, 2; china decorator, 1; convicts, 3; dressmaker, 1; farmer, 2; housewife, 2; hotel keeper, 1; miner, 1; millhand, 1; workmen, 4; mechanic, 1; soldier, 1; sailor, 3; woodsman, 1; watchmaker, 1; upholsterer, 1; not stated, 20.

As to the mode of occurrence: In most instances the trouble occurred as a result of a spree, generally together with friends or associates; in a few instances the alcohol was taken by accident. The preparations nearly all undoubtedly contained the drug, methyl alcohol, as the sole or chief toxic ingredient. In 28 cases methyl alcohol was specified; in 12 Jamaica ginger; in 4 Columbian spirits; in 2 essence of lemon or cinnamon; in 1 cologne spirits, so-called; in 1 an unknown alcoholic mixture; in 3 methyl alcohol vapor was inhaled.

As to the quantities consumed: The methyl alcohol series varied from half an ounce to 16 ounces. The Jamaica ginger from 3 ounces to 25 ounces, the larger quantities usually in divided doses over a period of several days. Columbian spirits from 6 ounces to 8 ounces and in 2 cases quantity unknown. Essence of lemon, 5 or 6 ounces in one case, in the other quantity unknown. Cologne spirits less than 8 ounces. Of the unknown strong alcoholic liquor, 15 ounces. Of the three inhalation cases quantity inhaled conjectural.

As to general effect: Headache was mentioned in 19 cases as a conspicuous symptom; gastric pain in 11; nausea and vomiting in 26; dilated pupils in 20.

The results as to visual disturbance were 16 total blindness, 3 total blindness of one eye, 15 partial recoveries, 7 recoveries; 10 remaining cases terminated fatally; sight became dim in three hours in one case; six hours in 1 case; eight hours in 1 case; ten hours in 1 case; twelve hours in 2 cases; twenty hours in 1 case; twenty-four hours in 19 cases; forty-eight hours in 5 cases; three days in 2 cases; six days in one case; seven days in one case; sight became lost in twenty-four hours in 10 cases; in thirty hours in 2 cases; in twelve hours in 2 cases; in forty-eight hours in 3 cases; in three days in 3 cases; in four days in 3 cases; in five days in 2 cases; in six days in 2 cases; in seven days in 1 case; in eight days in 1 case; in seventeen days in 1 case. Of the remaining 21, facts in this connection are not definite.

Certainly few members of the medical profession, and practically no one of the general public, are as yet aware that methyl alcohol taken into the system in moderate or considerable quantity not infrequently causes death, after the manner of the cases just cited. More than this, the people are still less cognizant of the fact that a certain proportion of those who survive the poisonous effect of the drug are condemned ever afterward to the miseries of greatly impaired vision, and, indeed, not infrequently to absolute blindness. It is a remarkable circumstance that notwithstanding the accumulated evidence of many similar recorded facts, there still exists a widespread unbelief in the toxic action of wood alcohol. Not long ago, with the object of discovering cases of methyl alcohol poisoning known to have occurred in Canada, Dr. Buller wrote to thirty or more Canadian oculists, asking each one for his experience in this direction. One sent this reply, which is worthy of record. It runs as follows:

I have not met with any case of blindness from drinking wood alcohol nor heard of any, *notwithstanding the fact that*

I live quite near one of the largest distilleries of methyl alcohol in Canada. The prevalence of the habit of intoxication from wood alcohol must be greatly exaggerated.

The italics are Dr. Buller's. Two only sent records of cases they had seen; some fifteen replied that they had no experience.

Altogether, Dr. Buller knows of only five reported and three unreported cases in Canada, and has heard of four others, without so far having been able to obtain facts regarding them. Of the five reported cases, three if not four actually occurred in the United States, giving, therefore, up to the present time only one reported and three unreported cases which have happened in Canada. It would thus appear that wood alcohol poisoning occurs much more frequently in the United States than in Canada, since of the 54 cases of which Dr. Buller has collected details, some 47 occurred in the United States and two in Europe.

B.—CASES (HITHERTO UNPUBLISHED) OF BLINDNESS, OR OF BLINDNESS FOLLOWED BY DEATH FROM DRINKING METHYL ALCOHOL.

CASE 1.—(From Dr. James A. Bach and Dr. Joseph Schneider, Milwaukee, Wis.)

D. McK., Ashland, Wis., on Nov. 26, 1903, was taken ill with abdominal pains and diarrhea, while engaged in "scaling" lumber in the northern woods of Redcliff, Wis. Being far from any doctor, he secured a bottle of Hinkley's bone liniment and took the same internally according to directions, a teaspoonful every hour for a few hours, then less often. This treatment he continued from November 26 to November 27 inclusive. On November 29 Mr. McK. found his sight leaving him. Within twenty-four hours he became totally blind in his left eye and partially so in the right eye. He thereon consulted a doctor in Ashland, Wis., who told him that the "liniment" had probably "done the work." The patient is now (May, 1904), a man of about 46 years old, strong and robust in appearance and apparently has no bad habits. There is nothing in his history to account for his condition but the fact that he took the quack medicine as above stated, which was followed so promptly by practical blindness. The left disc is gray-white, and the smaller papillary capillaries and vessels are absent, with the exception of the lower macular artery, which is still seen. The larger arteries and veins are reduced in size about 20 per cent. V. = no perception of light. The right disc is also whitish, with a decided diminution of capillary circulation, but not so marked as the left. V = 3/40. The visual field in the right eye shows a large, absolute scotoma, not quite central, with concentric limitation marked.[1]

CASE 2.—(From Dr. Wilfrid Beaupré, Quebec, Canada. Reported by Dr. Frank Buller, Montreal.)

J. D., aged 42, machinist, was in the habit of indulging in liquor to excess every month or two. After one of these "sprees" on March 6, 1898, having no more whisky on hand, he drank about half a tumblerful of methyl alcohol from a bottle in the house. He took this one drink only and in a few hours drove to the doctor's office nearly blind. His vision in either eye was finger counting at nine inches. He had intense photophobia and pain in the head; the papillæ were white, but the retinæ showed no particular change. He was immediately put on potassium iodid with bromids. For a time there was considerable improvement in his vision so that he returned to work. On March 20, however, he again noticed failing sight and when Dr. Beaupré saw him on March 21, V. R. = 15/40; V. L. = 15/200. The iodid was continued and he returned on the 31st, when V. R. = 15/20; V. L. = 15/40. April 18, 1898, V. R. = 15/40; V. L. = 15/100. April 25, V. R. = 15/50; V. L. = 15/100. Then citrate of iron and strychnia were prescribed. On May 9 the nerve heads were decidedly white. V. R. = 15/75, and V. L. = 15/200. The patient's eyesight now became so defective that he was obliged to abandon his work and engage in selling candy in a small store. Even then he found it difficult to recognize coins or to distinguish the figures on bank bills. When Dr Beaupré last heard of him he had entirely lost useful vision.

CASE 3.—(From Dr. M. H. Bell, Vicksburg, Miss.)

M. B., man, white, aged 50; occupation, blacksmith. Now in the Mississippi State Charity Hospital under Dr Bell's care. V., each eye, = light perception; eyes look entirely normal externally. Ophthalmoscope shows no marked changes. There is more pigment scattered over the fundi than is usually found. Nerve heads normal; vessels, both veins and arteries, are small, two-thirds usual size. Two years ago he was working in a "dry" county and, as was the habit there, used "peruna," Jamaica ginger, etc., as stimulants. The patient's usual drink was the ginger, and he told Dr. Bell that he had been taking an occasional drink of it for three or four months. While at work one day he suddenly became blind, so that he had to be led home by another man. This was followed by nausea lasting two or three hours. On the same morning he had taken two or three drinks of ginger, rather indefinite as to quantity. On the following day his sight returned, but since that time gradually failed for eighteen months, after which it has remained the same. He can not now go about without some one to guide him. Although no analysis was made of these beverages, the clinical history and the other facts in the case point directly to methyl alcohol intoxication.

CASE 4.—(From Dr. George H. Bicknell, Omaha, Neb.; Dr. George B. Simpson, Sheridan, Wyo.; Dr. Casey Wood, Chicago.)

G. W. A., ranchman, Scotch, aged 35, had always had good health. An examination by Dr. W. A. Evans of Chicago proved him to be free of syphilis, rheumatism, or any disease of his internal organs. Blood, urine, etc., normal. On July 4, 1899, in company with a number of companions, he proceeded to celebrate the day by getting gloriously drunk. It is not known exactly what sort of alcohol the party imbibed, but it was considerable in amount. For the following four days he suffered from severe and constant frontal headaches, nausea, pain in the abdomen, frequent fits of vomiting and difficulty in breathing. About forty hours after the spree began he noticed a "dazzling" sensation in front of his eyes and in two or three hours more was totally blind. Dr. Wood saw him in consultation with Dr. Bicknell on July 28, 1899, when he said that on July 25 he first noticed his returning eyesight. This improvement in vision continued for a while, but there was a relapse about the time he left for his home in Scotland, the following November. On July 28, 1899, V. R. = no p. l.; V. L. = hand movements in the lower third of the field. Pupils widely dilated. Tension normal. Light reflexes absent; doubtful as to accommodation. Lenses showed a few striæ. Both fundi exhibited blurred papillary outlines with loss of the usual transparent appearance of the nerve heads. Retinal veins somewhat engorged; arteries smaller than normal. This patient was vigorously treated by Dr. Simpson with potassic iodid, electricity and, later, was ordered full doses of iron and strychnia. Improvement for a time set in, with enlargement of the small eccentric field for white in the left eye. In July, 1899, he was able to see shadows and the outlines of large objects in the upper part of the right field and to count fingers at six inches with a small area in part of his upper left retina. On Nov. 13, 1899, his vision was much worse. He, at that time, perceived hand movements in the left eye eccentrically, but there was no light perception in his right eye. The fundus pictures were then greatly changed. The nerve heads showed shallow, atrophic excavations, the discs being whitish; veins of normal size, arteries small. Tension normal in both eyes. The patient was given a letter to Dr. Argyll-Robertson, Edinburgh, and has not been heard from since.

CASE 5.—(From Dr. Emil Bories, Seattle, Wash. Reported by Dr. Hamilton Stillson, Seattle, Wash.)

A German, aged 27, cabinetmaker by trade, drank about two ounces of wood alcohol that was used in a saloon for filling cigar lighters. Seen about an hour afterward. Was in deep stupor, snoring, stertorous breathing; could not be aroused by his companions. Features pale, body cold, bloody froth from

1. An examination of the proprietary remedy referred to in this report was recently made for me by a competent chemist, and found to contain a large percentage of methyl alcohol.—C. A. W.

mouth, pupils dilated, no reflexes. Had him taken to city jail, where, after heroic rubbing, applying of hot packs, and hypodermic injections of strychnia, he was sufficiently aroused to answer his name. Recovery. Vision, as well as his gait, was affected for several days.

CASE 6.—(From Dr. A. H. Brundage and Dr. James W. Ingalls, Brooklyn, N. Y.)

Mrs. M., living at East Brooklyn, N. Y., aged about 35, was addicted to the excessive use of alcoholic drinks and occasionally drank grain alcohol with water and sugar. Having heard that wood alcohol was about the same thing but much cheaper, she purchased half a pint and drank most of it.

She was found partly unconscious and sweating profusely. She was nauseated, vomited severely and was delirious, with pupils dilated. Seemed chilly. Vision gradually became blurred. Died in about thirty-six hours from the time the wood alcohol is supposed to have been drunk.

Treatment.—Free syphonage of the stomach, cold effusions to head, caffein, digitalis, pilocarpin, external heat, oxygen, rectal injections of hot coffee, and also of normal salt solution.

CASE 7.—(From Dr. Henry D. Bruns, New Orleans, La.)

A man, about 50 years of age, came to the clinic in 1902 with the following history: He had made toddy one evening with Columbian spirits, of which he took several drinks, using at least an ounce of the wood alcohol. Shortly afterward his vision completely failed him. He then regained much of his sight for a brief period, but finally became totally and permanently blind.[2]

CASE 8.—(From Dr. Henry D. Bruns, New Orleans, La.)

This case,[2] is that of a man of middle age who ingeniously concocted a "highball" whose spirituous portion consisted of a popular "antiseptic." He promptly became blind, but when seen a week later had somewhat improved in vision. He left the clinic and it is not possible to say whether the improvement held or not. Dr. Bruns had the proprietary article employed by this patient analyzed by the chemist of the board of health. It contained a large percentage of wood alcohol.

CASE 9.—(From Dr. A. E. Bulson, Jackson, Mich.; Dr. Pray, physician to the State Prison, Michigan; Dr. J. F. Byington, Battle Creek, Mich.)

John C., convict, aged 48, appeared March 5, 1903, at morning sick call and asked to be excused from work. He walked unsteadily and the pupils were somewhat dilated. He said he had eaten no breakfast and had vomited. On accusing him of having taken some drug he admitted that he had drunk wood alcohol. This was used in the prison shirt shops for dampening collars for the purpose of turning them. The mixture was equal parts of wood alcohol and water with glycerin, 2 ounces to the pint. On March 3 patient consumed 10 ounces of this mixture, and on the next day 4 ounces. He was sent to the hospital and treatment, consisting of large doses of bismuth, given to quiet the intense, burning pain in the stomach. At 7 p. m., although the electric light at the head of his bed was turned on, he asked to have a light; in other words, he was apparently blind. Dr. Pray says the blindness came on quite suddenly. He instituted alternate hypodermics of pilocarpin and strychnia every four hours (1/16 gr. pilocarpin, 1/30 strychnia), and potassic iodid grs. 20. On March 10 the patient could distinguish the hand held close to his eyes. March 15 he could see quite plainly. March 18 again failing vision, and on March 24 very poor vision. Discharged from hospital March 27. Strychnia and potassic iodid continued in pharmacy. Vision 7/30. Dr. Bulson examined this case later and found only light perception in the right eye with blue white discs, and marked retinal changes, the former more pronounced on the temporal side. In the left eye V. = 3/20 for central vision; about the same changes in the papilla. There was a decided contraction of the peripheral field. In September, 1903, Dr. Byington again examined this man who, then a blind peddler, presented himself with the request that the physician, as a matter of charity, give him a "statement of his case" so that he could the better dispose of his small stock in trade. Dr. Byington made only the superficial examination demanded by the patient and found V. = finger counting at 3 to 4 inches in each eye, associated with white atrophy of both nerve heads—each lamina cribrosa being distinctly visible at the bottom of a shallow, atrophic excavation.

CASE 10.—(From Dr. Homer Collins, Duluth, Minn.)

J. A., aged 46, carpenter, Cromwell, Minn., was in the habit of going on several sprees yearly, but avoided liquor between these sprees. Used tobacco, smoking or chewing about "ten cents' worth a week." On Nov. 22, 1901, with a companion, he drank about one dozen bottles of Jamaica ginger bought at Cromwell. The following day the companion vomited freely, but his eyes did not suffer. The patient vomited "everything" the next day and his eyesight began to fail at once. On the second day he could distinguish only light from darkness, and remained in this condition for two days. Then improvement of vision began and continued until about Dec. 12, 1901, when V. = 2/200 (white letters) in either eye. Right half of each field was covered by a scotoma, the most acute vision being eccentric, to the nasal side of the fixation point. In the left eye the field is very little contracted; central vision is best. There is some tenderness above and behind the eyeballs. The patient gave the history just outlined and stated that immediately after the poisoning he had considerable pain in his eyes, which were too sore to touch. He was put on pilocarpin treatment, under care of the county physician, and on December 22 thought he could see a little better, but tests showed no improvement, and there has since been little change in his condition. Bilateral, post-neuritic optic atrophy.

CASE 11.—(From Dr. Coote of Quebec, and Dr. Frank Buller, Montreal, Canada.)

A man between 28 and 30 years of age, well built and healthy in appearance, without any history of a serious illness, while working in a lumbering camp, caught a slight cold. To cut the trouble short he took what he considered a big dose, about a wineglassful, of methylated Jamaica ginger. He commenced to suffer from violent headaches and retching shortly afterwards. Some twelve or fourteen hours later his sight commenced to grow dim. A second dose was then taken and his sight grew worse. He was taken home and, with the exception of his eyes, he was shortly well again. About three months later, when he appeared at the hospital, central vision in both eyes was completely lost. Toward the periphery of the field of vision in both eyes a few patches of retina remained sensitive to light and fingers could be seen at a couple of feet. The pupils reacted to light and on convergence. Both discs were pale (not white) and the margins well defined; the arteries and veins were contracted, but not equally; the media were clear. He was kept in the hospital for some weeks, but the treatment was of no avail.

CASES 12 and 13.—(From Dr. Homer Collins, Duluth, Minn.)

In the year 1900 (exact date unobtainable), an Indian from one of the Minnesota reservations, accompanied by an Indian attorney (G. H. B.), consulted Dr. Collins. The history of the case showed that at least six Indians, having procured a supply of essence of lemon, drank freely of it. Three died promptly, evidently from the direct effects of the beverage, one of them becoming blind before death. Two others suffered considerably, but recovered without apparent damage to any of their organs. The sixth Indian, the patient under discussion, survived, but became totally blind. An ophthalmoscopic examination revealed marked atrophy of both optic nerves.[3]

2. This case, as well as the next one, is entered in the tables published by Dr. Bruns in the annual report for 1902 of the New Orleans Eye, Ear, Nose and Throat Hospital.

3. Through the kindness of Dr. J. W. Chamberlin of St. Paul, Mr. G. H. B. wrote me the following note, giving further information regarding this matter: "Your letter of inquiry reached me at White Earth, Minn. In reply, an Indian trader, named Malone (afterward prosecuted by the U. S.), sold to several Mille Lac Chippewa Indians a number of bottles of essence of lemon on June 28, 1897, which they drank in lieu of alcohol, when that had been exhausted. A large number of Indians drank alcohol; only six or eight drank the essence of lemon. The latter were all taken seriously ill within an hour after they began to drink the essence, and three of them died before morning. I can recall the name of only one of those who died, a chief, Mah-che-kewis. Another Indian, Bud-dub-ay-keshig, became blind and has not since recovered his sight. He is still living at Mille Lac, Minn. The others, although very sick, recovered without any bad effects. It was thought at the time that the death of the Indians was due to the wood alcohol in the essence of lemon." C. A. W.

CASE 14.—(From Dr. W. G. Craig, Hartford, Conn.)

M. J., colored, aged 50, was given as a beverage a mixture of sugar, water and Columbian spirits, about three fluid ounces in all. This was on April 30, 1902. The dose was followed by nausea and vomiting and in twelve hours by complete loss of vision. She recovered her sight to some degree, but a month later it was only ⅙ in each eye. Nerve heads chalk white.

CASE 15.—(From Dr. M. M. Cullom, Nashville, Tenn.)

While acting as interne in the Manhattan Eye and Ear Hospital, New York City, the following case came under Dr. Cullom's care:

In October, 1897, a workman was brought into the hospital with the following history: Two nights before he drank some wood alcohol in his room. It threw him into a stupor and, as he expressed it, "When he waked it was so dark that he supposed it was still night." He groped his way out into the hall and asked some one the time, and was informed that it was about 9 o'clock in the morning. The following day he was brought to the hospital. His pupils were widely dilated and did not respond to light. He had only perception of light in both eyes. The ophthalmoscope showed both nerve heads to be milk white in appearance and the entire fundus was blanched, the vessels being much smaller than normal. He was put on increasing doses of strychnia nitrate, administered hypodermically, which were carried to the physiologic limit. The vision improved for a short time until with his left eye he could count fingers, but the improvement was soon lost and he was discharged as hopelessly blind. There was no attempt made to secure a sample of the alcohol.

CASE 16.—(From Dr. I. F. Dickson, Portland, Ore.)

Two teamsters, strong, healthy men, under 30 years of age, who had been working hard all night, arrived at a friend's house in the early morning, much fatigued. The friend offered them a drink of something that, he said, "would make them feel better." He accordingly prepared a mixture of wood alcohol and water sweetened with syrup. One man died toward evening. The other took only a few mouthfuls and spat some of it out, as he did not like the taste. Shortly afterward he became unconscious and remained so till next morning. When he awoke he could only distinguish light, and within three weeks the sight was entirely lost. About this time the discs began to show signs of atrophy; otherwise the fundi were normal. He was first seen by a physician shortly after taking the drink, when it was noticed that the pupils were slightly dilated, but nothing abnormal was then seen in the background of either eye and no fundus changes appeared for about three weeks. The latest report from the patient is that he is still totally blind.

The following case is of great interest owing to its early occurrence (1898). It was one of the first examples of blindness due to bay rum made from Columbian spirits:

CASE 17.—(From Dr. J. A. Edwards, Columbia, Tenn.)

In February, 1898, he was called to Centerville, a town thirty-one miles distant, to see a young lawyer, W. A. K., aged about 26 years, who gave the following history: Living in a "dry" town and being in the habit of going on periodical sprees he called on a friendly physician who was in the habit of giving him a prescription containing alcohol and any other simple drug which would protect the druggist filling it from prosecution for violation of the liquor laws. On this occasion he was given, to supply the needed alcoholic beverage, as well as to protect the druggist against the provisions of the prohibition law, the following prescription:

℞. Bay rum .....2 fluid ounces.
Alcohol .....4 fluid ounces.
Sig.: To be applied externally.

He drank all this in an hour or so, and was afterward seized with violent pains in the stomach, nausea and vomiting, which continued about 24 hours, when he became totally blind. Dr. Edwards found him with pupils widely dilated and some tenderness of the globe on firm pressure. Having obtained the above history of his case the diagnosis of retro-bulbar neuritis or toxic amblyopia was made. At that time very few reports of such cases had been published, but he was given an unfavorable prognosis, and was told that his vision would probably clear up in from ten to twenty days, but that blindness, either partial or complete, might recur from secondary changes in the optic nerve. The patient promised to call on Dr. Edwards in a few days, but saw, instead, another very competent oculist, under whose care for three or four weeks his vision cleared almost to normal. Very soon thereafter his sight again declined to 20/60, with scotomata in parts of the visual field. He still sees only well enough to read very large print, and that with much difficulty, on account of the scotomata. He practices his profession, but is very much handicapped, his wife being obliged to assist him in his legal work. Investigation developed that the "bay rum" in this prescription with which he was poisoned, was put up by a firm in Buffalo, N. Y., and made of Columbian spirits.

CASE 18.—(From Dr. W. E. Driver, Norfolk, Va.)

J. B., male, white, age 25, U. S. sailor, brought July 12, 1898, from the U. S. Naval Hospital, by the surgeon in charge. He gave the following history: One week since the patient and two of his companions, who were in charge of a naphtha launch, indulged freely in the wood alcohol used in starting the engine. He and his companions were made desperately sick, and he became totally blind.

The pupils were widely dilated, but there was no visible pathologic change in the fundus. The diagnosis was wood alcohol amblyopia. Treatment was potassium iodid, ten grains three times a day at first; increased doses later. July 16, 1898, pupils still widely dilated. Had something more than light perception in each eye. Optic nerve, each eye, decidedly paler than at the previous visit. July 23, 1898, decided improvement in vision of each eye. Can now recognize large objects. Both pupils widely dilated. Eyes very bright. Both optic nerves show decided pathologic changes, and very much whiter than at previous visit. Dr. Driver learned from the Naval Hospital that soon after the last visit to his office, the patient was discharged from the Navy and nothing further was heard of his case. His two companions died during the debauch, from the effect of the intoxication.

CASE 19.—(From Dr. W. E. Driver, Norfolk, Va.)

A. H. S., male, white, aged 25, came Feb. 2, 1903. Referred to Dr. Driver by Dr. Holland of Holland, Va. The patient became suddenly blind ten days before. When he went to bed he could see as well as ever; on waking was totally blind. Had been drunk from cider purchased from a country store.

Right eye: Cornea very bright and glistening. Pupil widely dilated. Optic nerve pale, but no other pathologic change in fundus. No light perception., No reaction of pupil to light.

Left Eye: Cornea clear and bright. Pupil widely dilated. Nerve white. No reaction of pupil to light.

Diagnosis: Wood alcohol amblyopia.

Patient was sent to hospital and given potassium iodid, 10 grains three times daily, and twentieth of a grain of strychnin. On February 9 vision began to return in left eye. Has light perception. No improvement in right eye. February 15, counts fingers one foot from left eye. Light perception only in the right eye. Optic nerve, each eye, decidedly paler than normal. February 23 patient went home, with no improvement in the right eye, but counts fingers at three feet with left eye. Nerve, each eye, white, bluish tint. Pupils widely dilated. Corneal reflex extremely bright.

This man has consulted Dr. Driver three times since he left the hospital the first time. There has been no improvement in vision of the right eye. With left eye vision is 6/200.

CASE 20.—(From Dr. William H. Dudley, Easton, Pa.)

Ralph W., single, aged 39, an essence pedler, about June 15, 1903, took for a "cold," diluted with water, four ounces of what he says he bought for grain alcohol. Two days later his vision became very bad, and when seen three months later his optic discs were quite white; fields were narrow; vision 1/200 right and left. Seven months later his condition remained practically the same. Patient states that as soon as he had

drunk the alcohol he discovered his mistake, realizing then that he had taken wood alcohol.

CASE 21.—(From Dr. H. P. Engle, Newton, Iowa.)

G. F. of Mingo, Iowa, aged 45, drank at least half a pint of Columbian spirits diluted. He lived forty-eight hours, but before death there were present gastrointestinal irritation, blindness, delirium and collapse.

CASES 22, 23 and 24.—(From Dr. W. H. Ford, Sulphur, Ind. Ter.)

As detailed elsewhere in this report, four men, aged from 30 to 40 years, went on a spree with methylated bay rum. Two, who consumed large quantities of the poisonous perfume, died. There is no history of blindness in one case, but the other, S. B. B., age 24, who succumbed to the poison, lived about eighteen hours, and suffered the most excruciating pain in stomach and bowels. Even though heroic doses of morphia, administered hypodermically, were given him, he had to be held in bed. He was totally blind most of this time. About an hour before death his pulse became imperceptible at the wrist, his heart being very rapid all the time. The odor of methyl alcohol was very noticeable in the perspiration, which was very profuse. The two that survived, aged 29 and 37, suffered for some twelve to fourteen days with marked ocular disturbances. Vision was very indistinct; it seemed at times as if they were "looking through a moving screen." Again, in a few hours there would be a total loss of the outlines of objects. After two weeks vision appeared to return.

CASE 25.—(From Dr. P. G. Goldsmith, Belleville, Ont., and Dr. Sprague, Stirling, Ont., and from the *North Hastings Reporter*, June 15, 1904.)

William Sutherland of Monteagle met his death under very distressing circumstances on Monday night. He had returned from working with the chemical company near Orillia and brought a bottle of wood alcohol with him to let his neighbors see it. Not suspecting its poisonous nature he let some of them taste it. Finding it too strong, they were all satisfied with merely tasting it. But Sutherland, it is estimated, took about a wineglassful. In a short time he complained of difficulty in breathing, then of blindness, and asked for a physician, who was sent for. He soon lapsed into unconsciousness and died before medical aid could arrive. Deceased was a respectable farmer about 45 years of age, and a widower, having two sons. The sad event cast a gloom over the community.

CASE 26.—(From Dr. A. H. Gordon and Dr. Frank Buller, Montreal, Quebec.)

B. K., aged 40, female, domestic, alcoholic. On Jan. 18, 1904, had been drinking for two days. Drank one quart of whiskey, a half-pint mixture of gin and spruce gum, as well as nearly eight ounces of wood alcohol. Vomited all one morning, and in the afternoon became excited, partially delirious. Complained of severe headache, pain in arms and fell to floor unconscious. Later, general convulsion and death in half an hour after convulsion. Half an hour before falling she groped about the room calling for light, evidently completely blind. Pupils widely dilated and inactive. The cause of death was undoubtedly the wood spirit drunk within twenty-four hours of her death. The autopsy showed no brain or kidney lesion.

(To be continued.)

An Aid to the Comfort of Bedridden Patients.—*American Medicine* says that in cases of severe heart disease with orthopnœa it is often extremely difficult to keep the patient in the semi-upright position as the direct pressure on the tuberosities of the ischium is not only uncomfortable, but is conducive to bedsores, and there is also a tendency to slip down in the bed. In such cases a hard bolster is placed under the mattress at the level of the thighs, forming with the pillows a double inclined plane, in the trough of which the back rests. The support and the removal of a part of the weight from the tuber ischii to the fleshy part of the thighs affords great relief to the patient.

FATAL POISONING DUE TO SKIN ABSORPTION OF LIQUID SHOE BLACKING (NITROBENZOL).

WITH AUTOPSY REPORT.

WILLARD J. STONE, B.Sc., M.D.
TOLEDO, OHIO.

A report of the clinical and autopsy findings in the following case is of interest, first, because of its rarity, it being, so far as I have been able to ascertain, the only case recorded in which the fatal result could be attributed to skin absorption of this poisonous agent; and, secondly, since it reiterates once more the danger attendant on the use of the various cheap products of coal-tar distillation as solvents for the anilin dyes in certain commercially manufactured articles.

Dr. A. W. Wheeler and Dr. Peter Donnelly have kindly furnished the clinical history of the case.

History.—W. R., aged 22, male, salesman, in excellent health so far as could be ascertained, was taken suddenly ill in a café about 12:30 a. m., March 20. He had attended a dancing party earlier in the evening in company with some friends. After the party he and four or five of his associates went to the café for a lunch. His friends were with him during the entire time after he left his room earlier in the evening. He remarked while in the café that he did not feel well, but his friends noticed nothing unusual about his appearance except that he seemed very pale. In the café each one drank four or five glasses of beer. While standing up to put on his coat, which one of the men present was holding for him, he suddenly seemed to faint, and fell to the floor. He was carried into an adjoining room, and a medical student who happened to be present dashed cold water in his face, which seemed to revive him. He complained of no pain, but felt dizzy and faint, and shortly after vomited the beer, crackers and cheese eaten but a few moments before. He was assisted to a carriage, and arrived at his room at about 2 a. m.

A physician was not called until about 3:30 a. m., since his roommate supposed him in a drunken stupor. The physician, Dr. Wheeler, was informed that he had passed into the comatose condition on arrival at his room about 2 a. m., and that he had not recovered from it.

Examination.—Dr. Wheeler found him in collapse; very pale skin, eyes glazed, cyanotic lips, ears and finger tips, corneal reflexes absent, no peculiar odor to breath, no convulsive tendencies, heart action fairly good, both sounds clear, pulse rapid, 130, skipping about one beat in 25, respiration 28. His friends were unable to throw any light on the cause of his condition, except that they thought him drunk.

Death.—After giving 1/30 strychnin and 1/10 apomorphin, Dr. Peter Donnelly was called in consultation, but shortly after his arrival (4:45), a slight convulsion occurred, and with a sudden dilatation of the left pupil the heart stopped beating (not heard by auscultation or perceptible at wrist). Slight respiratory efforts continued for about five minutes, after which the patient died; in all, about four and one-half hours after the fainting attack in the café.

Autopsy.—This was made by me about six hours later, March 20. Length, 71 inches; weight about 160; good muscular build; no scars or deformities; no signs of trauma or surgical wounds; skin and all visible mucous surfaces very pale; ear lobes and finger tips cyanotic; hair black; both feet discolored black to above ankles, resembling the crock of black-colored hose; rigor mortis just beginning in jaw; no postmortem lividity of under surfaces; slight body heat present; no distention of abdomen; no edema lower extremities.

Thorax: Mediastinal tissue small in amount; lymph glands normal; no fluid in pleuræ; pericardial sac not distended; fluid normal.

Heart: Fatty covering normal; section muscle normal color; left ventricle wall hypertrophied, 20 mm. thick; mitral valve

admits two fingers; valve flaps thin, normal; aortic opening admits thumb; valves normal; coronary openings patent, traced to smaller ramifications; no thrombus or embolus; right heart normal; dark fluid blood and small mixed clot in right auricle; pulmonary artery traced to small ramifications; no embolus; thoracic aorta normal.

Lungs: Pleuritic adhesions both lungs behind and at apices; section, old scar right apex; anthracosis moderate; dark red in color, yields slight fluid on pressure, crepitant throughout; slight hypostasis lower lobes; bronchial lymph glands negative.

Abdomen: Omentum and peritoneum normal. Stomach: Ligated cardia and pylorus—removed entire. Spleen: 12 by 10 cm.; capsule normal, dark red on section; follicles, pulp and connective tissue normal. Liver: Not enlarged; brown-red on section; mottled appearance in areas; consistency normal; shows cloudy swelling; parenchymatous degeneration. Gall bladder and ducts: Normal; no calculi. Pancreas: Small, otherwise normal. Adrenals: Normal; small. Right and left kidneys: Identical in appearance; large capsules strip off readily; do not drip blood on section, though they appear congested; dark red in color; cortex paler in color; congestion (?); parenchymatous degeneration; acute nephritis (?). Ureters: Patent throughout. Bladder: Normal; 150 c.c. urine withdrawn by catheter for examination. Duodenum: Small intestine and colon normal; serosa not injected. Appendix: Long, free entire length; contains small, hard concretion.

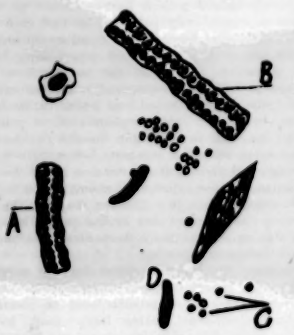


Fig. 1.—Camera lucida. Acute desquamative nephritis from nitrobenzol. (Zeiss, oc. 4, obj. A A.) A. True epithelial cast of medium-sized tubules. B. True epithelial cast of larger tubules. C. Red and white blood cells. D. Fine granular cast.

Brain: Meningeal vessels congested. Internal capsule normal. Vessels traced to finer branches; no embolus or hemorrhage. Ventricles normal. Basal sinuses, cerebral ganglia peduncles, circle Willis, cerebellum, pons and medulla, normal.

Stomach contents: About 40 c.c. opaque, rather thick, dark red fluid. Absence of free HCl to Congo red and di-methyl-amido-azo-benzol papers. Sour odor. Microscopically, much amorphous débris, cellulose fibers *en masse* (crossed striation), many finer cellulose particles. Many fat globules, large and small; many small non-motile bacilli; few shreds gastric mucosa (columnar celled); no crystals of any kind seen. Negative guaiac test for blood.

Urine: Amount withdrawn by catheter, 150 c.c.; specific gravity, filtered urine, 1013; reaction, acid; heat plus HNO_3, slightly positive; acetic acid plus potass. ferrocyanid, positive; Fehling's, negative; Nylander's, negative. Microscopic examination: Many white (see illustration), and red blood cells; many finely granular casts (medium size); many larger hyaline and leucocyte casts; few very large epithelial casts of the larger tubules (about one in every two fields with low power); bladder epithelium and spermatozoa (death phenomenon).

Microscopic examination of liver: Congestion slight, cloudy swelling (parenchymatous degeneration) and fatty degeneration quite general throughout sections; necrosis in areas.

Microscopic examination of kidneys: Stained in eosin-hematoxylin and Van Gieson. Cloudy swelling (parenchymatous degeneration), general throughout sections. Necrosis in areas. Much débris in larger tubules. Partly exfoliated epithelial lining of tubules in many areas.

Diagnosis.—Acute desquamative nephritis and acute hepatitis (toxic?).

Etiology.—Subsequent inquiry four or five days later into the circumstances surrounding the death by the coroner, Dr. C. Storz, revealed the following facts: The young man had purchased, a few days before his death, a pair of shoes at a sale being advertised in the city. These shoes were black patent leather lowers with cloth tan tops. On the evening of the dance above mentioned he had applied a liquid shoe blacking, made in Chicago, to the tan cloth uppers of the shoes. These shoes were worn that evening. The cloth uppers absorbed enough of the blacking to entirely cover up the tan color, and, moreover, since the shoes were put on before the tops were dry, to stain his feet and ankles black.

The coroner found in the man's room part of the bottle of blacking used and also the shoes. Both the shoes and blacking emitted a strong odor, not unlike oil of bitter almonds, the shoes having this odor a week after death. A portion of the blacking and the shoes were turned over to City Chemist G. A. Kirchmaier. Through his kindness I am able to append his report.

Chemical Examination.—About three drams of liquid shoe-blacking was received from the coroner. Suspecting nitrobenzol from the odor, the blacking was distilled after adding H_2SO_4, according to the method of Jacquemin.[1] To the distillate zinc and H_2SO_4 was added to reduce to anilin, after which the liquid was treated with excess of sodium carbonate and filtered. On the addition of a drop of carbolic acid and then some sodium hypochlorite a brown coloration, rapidly changing to blue, appeared, due to formation of sodium erytrophenate, and which indicated the presence of nitrobenzol. The amount of pure nitrobenzol obtained was nearly as much as the total amount of blacking received from the coroner. The shoe tops were also extracted with solvents and marked traces of nitrobenzol obtained.

Reinsch's test for poisonous metallic salts was applied to stomach contents with negative results.

Nitrobenzin (or nitrobenzol $C_6H_5NO_2$) was discovered by Mitscherlich in 1834. Casper,[2] cited by Blyth, first called attention to its poisonous properties. Its importance as a commercially used article lies in the fact that it is a cheap solvent for the various anilin dyes and that it is used as a flavoring or odoriferous agent, under the name "Essence de Mirbane," in cheap perfumes, soaps and confections. Nitrobenzol is an intermediate product between benzin, a constituent of coal-tar, and anilin. It is in reality formed from the action of nitric acid on benzin ($C_6H_6+HNO_3=C_6H_5NO_2+H_2O$), and anilin, the next step in the process, is formed direct from nitrobenzol (Allen[3] and Lloyd[4]).

Pure nitrobenzol is a pale yellow liquid, having an odor closely resembling that of the essential oil of bitter almonds. It differs, however, from that body in many respects, the oil of bitter almonds being benzoic aldehyd (C_7H_6O).

SYMPTOMS.

Jübell[5] collected, between 1848 and 1876, 42 cases of poisoning by nitrobenzol, 13 of which were fatal. R.

1. Jour. Pharm. Chim., 4, vol. xxii, p. 375.
2. Casper: Vierteljahrsschrift f. Ger. Med., vol. xvi, s. 50, 1859.
3. Allen: Commercial Organic Analysis, vol. ii, p. 478, 1887.
4. Lloyd: Twentieth Century Practice, vol. iii, p. 400, 1895.
5. Jübell: Die vergiftung en. m. Blausaure u. nitrobenzol in Forensischer Beziehung, Erlangen, 1876.

Bachfeld,[6] cited by Gould,[7] has collected 63 poisoning cases by anilins and benzols. He concludes that there is danger of poisoning if clothing soaked with anilin or nitrobenzol remains in contact with the body. Nitrobenzol is a powerful narcotic poison, whether taken in the form of vapor or as a liquid. The fatal dose for an adult is probably about 1 gram, although numerous examples exist of serious poisoning by much smaller doses. The quantity which would be fatal if breathed is not known with any accuracy. Husemann[8] mentions several cases of poisoning associated with the symptoms stated by the various authors mentioned as common to all: 1, fainting; 2, cyanosis, and 3, coma. A case cited by Taylor[9] is typical:

A woman tasted a liquid used for flavoring pastry (it was afterward chemically identified as pure nitrobenzol. She immediately spat it out, swallowing probably not more than a drop. In replacing the bottle about a tablespoonful was spilt. As it was a small room the vapor rapidly permeated the atmosphere in it, and caused illness in herself as well as in a fellow servant. In about three hours, when seen by a physician, she showed symptoms of prussic acid poisoning. The features were pale and ghastly, skin clammy, lips and nails cyanotic, pulse feeble but mind clear. She became suddenly unconscious a few moments later, consciousness returning in eleven hours. Recovery not complete for weeks.

This case is exceptional, since recovery in instances where coma has developed is very rare.

Blyth[10] states that the symptoms are almost identical with prussic acid poisoning, except that in nitrobenzol poisoning there is a much longer interval between taking the poison and its effects. "This is, indeed, the strangest phenomena of nitrobenzol poisoning, for the person taking it may appear well for periods varying from fifteen minutes to three hours, or even longer, and then there may be the most alarming symptoms, followed by coma and sudden death." (Note similarity to the present case, also Dr. Collamore's case below.)

Cases vary but little in their main features; in a few the blue skin and deep sleep are the only symptoms noted. This, of course, is quite typical for excessive doses of any of the coal-tar products, i. e., antipyretics, naphthalene yellow, metanil yellow, orange II or picric acid combinations. These latter have been used as constituents of butter color along with anilin yellow (dimethyl-amido-azo-benzin), and from the use of which several fatal poisoning cases have been recorded.

Nicholson[11] reported a case of fatal poisoning by liquid nitrobenzol. He stated also that the vapor from "almond glycerin soap" had caused in a friend of his who used it while taking a warm bath symptoms of mild poisoning (fainting and illness for some time afterward). It would seem that the circumstances surrounding this last case were favorable to skin absorption of the poisonous agent, and that the symptoms of poisoning which followed could be attributed to absorption in such a way.

Dr. G. A. Collamore, Toledo, about ten years ago attended a man who, when intoxicated, touched a small bottle of nitrobenzol to his lips under the impression it was whisky. The accident happened in the home of a local soap manufacturer, who had brought the stuff to the house from the factory and deposited it on the mantel because it imparted a pleasant (*sic*) odor to the air of the room. Shortly after, the man became unconscious and was cyanotic. After twenty-four hours he regained consciousness and insisted on returning to his work, though still cyanotic. He died suddenly while attending to work twenty-four hours later. The skin was dark colored and the breath exhaled the odor of bitter almonds.

Letheby[12] relates the case of a man who spilt some considerable quantity on his clothes. For several hours afterward he went about breathing an atmosphere of nitrobenzol. He then became drowsy, expressionless, and, with unsteady gait, presented the symptoms of intoxication. The stupor suddenly developed into coma and the man died, the fatal course being altogether nine hours, i. e., four hours before coma and five hours of total insensibility.

The first symptoms usually are headache, drowsiness, flushing of the face (which is shortly followed by extreme pallor, with cyanosis of the ears, finger-tips and lips), dyspnea (not present in the case under consideration), dilation of pupils, loss of voluntary power, and sometimes convulsions. These symptoms are followed by coma, which usually appears suddenly and increases in intensity till death ensues in five or six hours. When the stage of coma is reached there is but little chance of preventing a fatal termination (Allen). Death is usually stated to be due to paralysis of the respiratory centers. In the present case death was evidently caused by paralysis of the circulatory centers, since the heart stopped beating about five minutes before respiratory efforts were discontinued.

POSTMORTEM FINDINGS.

It is such an insidious narcotic poison that indications pointing to severe irritative action on stomach or bowels—when swallowed—are usually absent. The kidneys and liver may show extensive parenchymatous degeneration, as in the present case, this being probably mere evidence of the attempted eliminative process on the part of these organs. The changes are, however, no different from the action of many other actively poisonous agents. When swallowed the breath may give off an odor resembling the oil of bitter almonds. Filehne[13] states that the blood gives the spectrum of acid-hematin. A dark brown to black color of the blood has been noted in some cases—the blood not being coagulated.

Cushny[14] says that the oxygen-carrying power of the hemoglobin, when combined with nitrobenzol, seems to be lost. Its carbon dioxid is also decreased. With the spectroscope methemoglobin has been found, although in two cases—not fatal—cited by Huber[15] the blood was chocolate colored, but gave in both instances normal blood and spectroscopic tests. An absorption band which does not seem to correspond to any of the usual hemoglobin products, often appearing between the yellow and red, has been noted in several cases. It has been designated the nitrobenzol-hemoglobin line.

Weyl[16] mentions that sugar is found in the urine in nitrobenzol poisoning, although in the present case (and in Huber's cases, mentioned above) no reducing substance was present which reacted to Fehling or Nylander solutions.

6. Bachfeld: Vierteljahr. Gericht. Med., 1898.
7. Amer. Year Book, Med. and Surg., 1899.
8. Husemann: Jahresbericht, s. 531, 1872.
9. Taylor: Poisons, 3d ed., p. 665.
10. Blyth: Poisons—Their Effects and Detection, vol. i, p. 162, 1885.
11. Nicholson: Lancet, Feb. 1, 1862, p. 135.
12. Letheby: Royal Soc. Reports, 1863.
13. Filehne: Ueber d. Giftwirkungen d. nitrobenzols, Arch. f. Exper. Path. u. Pharmakol., vol. ix, p. 329.
14. Cushny: Pharmacol. a. Therapeut., p. 411, 1899.
15. Huber: Giftwirkungen d. nitrobenzols, Virchow's Archiv, vol. cxxvi, 1891.
16. Weyls' Monograph: The Sanitary Relation of the Coal Tar Colors, by Leffmann, 1892.

TREATMENT.

Since death occurs from narcotic action, with subsequent paralysis of the respiratory and circulatory centers, in this as well as in poisoning with other coal-tar-anilin preparations, a prompt emetic should be given or the stomach tube used. The stomach tube should be used, since, as in the case of morphin, the possibility of the drug being excreted into the stomach and bowels should be borne in mind. An effort should be made to ward off the impending coma; constant exercise, flagellation with wet towels and rubbing being employed. Hypodermically, atropin 1/100 to 1/60 gr. and cocain 1/4 to 1/2 gr. might be used for their stimulative action on the respiratory and cardiac centers. Evidently the process of elimination is attempted by the kidneys (as in the present case) and possibly also by the bowels. Large quantities of hot normal salt solution per rectum or intravenously would undoubtedly assist in this process. The depressant action of and danger attending the use of pilocarpin to assist elimination by the skin, in cases of already depressed circulatory activity, would seem to be contraindicated because of the danger of pulmonary edema.

CONCLUSIONS.

This case reiterates the danger of the promiscuous use of nitrobenzol by manufacturers. How they are able to prevent poisoning among the workers in their factories is somewhat of a mystery. Its use should be still more strenuously prohibited as entering into the composition of liquid shoe blacking, cheap soaps, confections and similar articles of widespread usage. The conditions present in this recorded case were unfortunately such as to permit of absorption by the skin. The shoes were put on before the blacking was dry, and shortly afterward the exercise incident to the dancing party probably aided its absorption. Nitrobenzol is probably used as a solvent for the anilin dyes in many liquid shoe-blackings on the market. The reason that the small boy shoeblack is not more frequently poisoned lies in the fact that but a very small quantity of the liquid comes in contact with his fingers, brushes being used instead, while the fingers are usually used for the application of the "polish." The "polish" is probably an anilin-black in most cases and probably contains nitrobenzol as a solvent. Why fatal poisoning is comparatively so rare among shoe-blacks is not quite clear. Perhaps but extremely small quantities are absorbed and that this absorption extends over a considerable time.

SPLENECTOMY FOR SPLENIC ANEMIA.

J. H. CARSTENS, M.D.
DETROIT.

Splenic anemia is a distinct variety of anemia, and entirely different from the various conditions characterized by enlargement of the spleen and classified under various names. The distinctive features are enlargement of the spleen without enlarged lymphatics, evidence of pigmentary deposits, and if long continued, disturbance of the liver and ascites. So far as etiology is concerned, nothing definite is known.

The special features of the condition are: 1, Slight diminution in the number of red corpuscles; 2, reduction in hemoglobin, and 3, a most remarkable reduction in leucocytes. This last seems to be the pathognomonic condition.

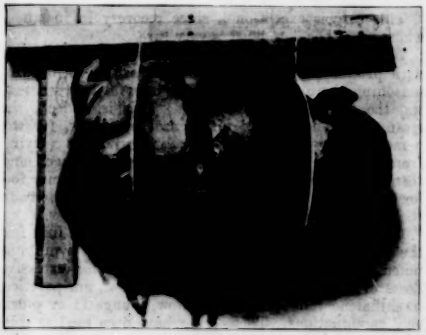
H. C. Wood[1] first described this in 1871. He says: "I now desire to show that there is still a third form of pseudoleukemia, a splenic variety. Under the names of tumor of the spleen, splenic cachexia, etc., medical records furnish accounts of cases which I believe represent this affection." Griesinger, in 1866, describes a case in a child and called it anemia splenica, although it has since been shown that enlargement of the spleen in children is different from that peculiar enlargement found in adults.

Sippy has given us an excellent résumé on the subject and reported in full a case which ended in death. He gives all the blood examinations and careful microscopic examination of the spleen with illustrations.

Osler, in two papers, reports 18 cases, some of them having extended over a period of many years, the patients being in fairly good condition. Harris has also reported quite a series of cases.

My case is as follows:

History.—Mr. B., aged 38; had always been well until last winter, when his abdomen began to enlarge. He became weak and pale, digestion was poor and he was unable to work. Various remedies were tried without much benefit. The enlargement of the abdomen increased until it reached the symphysis, crowding the abdominal viscera toward the right. It



Spleen, removed by Dr. J. H. Carstens.

was diagnosed as an enlarged spleen. He was brought to me by Dr. Peterson of Ruth, and I had his blood examined by Dr. Sill of the Detroit Clinical Laboratory. The report is as follows:

Blood examination—Erythrocytes	3,804,000	
Hemoglobin	75	%
Color index	0.94	
Leucocytes	1,250	
Polynuclears	10	%
Mononuclears	90	%
Eosinophiles	..	

There was a marked reduction in the number of leucocytes and an enormous increase in the proportion of the lymphocytes. The red cells showed no degeneration.

Operation.—July 21. An incision was made along the outer edge of the left rectus, a large incision being necessary on account of the size of the growth. I found some slight adhesions of the omentum, but otherwise no complication. The spleen was very soft, almost like jelly. In trying to lift it out of the wound I turned it a little so that the apex would come out first. It broke and a severe hemorrhage occurred, which was controlled by clamping the pedicle. I removed the spleen, ligated the blood vessels separately and then the pedicle. There was one vein the size of an ordinary pencil. Several bleeding points in the omentum were ligated, the abdominal

1. American Journal of Medical Science.

cavity washed out and the wound closed. He was given an enema of two quarts of saline solution and put to bed.

During the first few days there was a temperature varying from 99 to 101 degrees, with the pulse 120. On the 26th the temperature went higher, and a blood examination made by Dr. Edmunds showed leucocytes, 11,000. On the 29th temperature went up to 105 degrees, pulse 132, and the increase of leucocytes indicated sepsis.

REPORTS BY DR. C. W. EDMONDS.

July 26.—Reds	2.745,000
Leucocytes	11,204
Mononuclears	27 %
Polynuclears	73 %
Hemoglobin	70 %
July 29.—Reds	2,919,200
Leucocytes	4,077
Mononuclears	18 %
Polynuclears	82 %
July 30.—Leucocytes	4,777
Mononuclears	19.7 %
Polynuclears	80.3 %
July 31.—Leucocytes	4,526
Polynuclears	85¼ %
Mononuclears	14 %
Eosinophiles	¼ %

August 26 I removed the dressing and examined the abdominal incision, which had been closed with sterilized catgut. I found a red spot which indicated a stitch abscess. This was opened and a small quantity of pus removed. The leucocyte count again dropped. He had been irrational for a day or two, and one night, in the temporary absence of the nurse, he got up and walked around the room. He was put to bed and a restraining sheet applied. The next morning, during a violent effort at coughing, something gave way, and on examining him I found that the edges of the abdominal wound had separated and the intestines were protruding. An anesthetic was administered, the abdomen thoroughly washed out and the incision closed with silkworm-gut sutures.

Results.—His recovery after this was rapid and uninterrupted. He developed a voracious appetite, his mind became perfectly clear, and he returned home four weeks after the operation perfectly well. A few days after sewing the abdomen I had another count of his blood made and the report by Dr. Sill was as follows:

August 1.—Erythrocytes	4.128,000
Hemoglobin	60 %
Color index	0.75 %
Leucocytes	2,668
Polynuclears	77.77 %
Mononuclears	22.23 %
Eosinophiles	....

In comparison with previous examination the blood showed a marked change. The red cells had increased, but the hemoglobin had dropped in percentage. There was an increase in the number of leucocytes with a startling change in the proportion of the varieties, the polynuclears regaining their normal proportion.

The spleen weighed fourteen pounds. The pathologic examination of the growth, made by Dr. H. Gibbs, is as follows:

Examination of Tumor.—Hyperplasia of splenic tissue without increase in the capsule or trabeculæ. The whole tissue is infiltrated with blood, in some places amounting to extravasation. There is no appearance of malignancy.

Further blood examinations were made occasionally by Dr. E. Edmunds as follows:

August 8.—Reds	3.325,000
Hemoglobin	65 %
Leucocytes—	
Mononuclears	26 %
Polynuclears	74 %
August 12.—Leucocytes	3,032
Polynuclears	51 1/3 %
Mononuclears	48 1/3 %
Eosinophiles	1/3 %
Hemoglobin	70 %

The peculiarity of the blood in these cases is the very small number of leucocytes. That seems to be distinctive of splenic anemia, but the most remarkable change was: 10 per cent. polymorphonuclears and 90 per cent. mononuclears before he was operated on, while ten days after the operation the proportion was nearly normal.

In order to throw more light on the subject I asked him to come for another blood examination. He came, and eight months after the operation the blood report, by Dr. Joseph Sill, is as follows:

Date received, April 5.—Erythrocytes	5,448,000
Hemoglobin	100 %
Color index	1.0 %
Leucocytes	9,250
Polymorphonuclears	58 %
Mononuclears	42 %
Eosinophiles	..

This specimen of blood was practically normal.

Beside this the man's appearance was remarkably improved. I did not have him weighed when he arrived at the hospital, but when he left he weighed 97 pounds, and the day the last blood examination was made he weighed 193 pounds, was the picture of health and in every way well, except having a slight bulging at the line of incision, and hence was incapacitated for hard physical labor.

SUMMARY.

1. Splenic anemia is a distinct variety of enlargement of the spleen
2. It can be diagnosticated by blood count, which shows an abnormal and small number of leucocytes. It is, as a rule, slow in its development, and is but slightly relieved or retarded by treatment.
3. Splenectomy seems to offer the only chance for a permanent cure.

X-RAY THERAPY IN LEUKEMIA.

A PRELIMINARY REPORT. WITH SPECIAL REFERENCE TO LYMPHATIC LEUKEMIA.

JOSEPH A. CAPPS, M.D., AND JOSEPH F. SMITH, M.D., CHICAGO.

EDITOR'S NOTE: The article with the above title in THE JOURNAL, Sept. 24, 1904, page 891, was marred by the inadvertent omission of the accompanying table. The readers of the article easily recognized the fact that something was omitted, as the table was referred to in the article.

CASES OF LEUKEMIA TREATED BY THE X-RAY.

Case No.	Type.	Acute or Chronic.	Effect of the X-Ray on Spleen.	Effect of the X-Ray on Glands.	Effect of the X-Ray on Leucocytes.	Time of Observation under X-Ray.	Present Condition.
1*	Spleno-Myelogenic.	Chronic.	Enormous mass reduced to small size. Recurrence.	None	261,000 to 10,000. Recurrence 220,000 to 9,400	18 months	Dead.
2	Spleno-Myelogenic.	Chronic.	Much reduced	None	409,000 to 46,500	12 weeks	Improved.
3	Lymphatic	Subacute	Much reduced	Reduced nearly to normal size.	70,500 to 25,000	10 months	Dead.
4	Lymphatic	Subacute	Not noticeable	Not noticeable	80,000 to 64,500	6 weeks	Dead.
5	Lymphatic	Acute	Not noticeable	Not noticeable	40,000 to 280,000	10 days	Dead.
6	Lymphatic	Chronic	Reduced	Much reduced	308,000 to 46,500	16 months	Dead.
7	Lymphatic	Chronic	Reduced	Much reduced	150,000 to 4,200	5 months	Improving.
8	Lymphatic	Chronic	Reduced nearly to normal size.	Reduced nearly to normal size.	295,000 to 6,800	8 months	Improving.

*Case previously reported by Dr. Senn.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

103 DEARBORN AVENUE . . . . CHICAGO, ILL.

Cable Address . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

SATURDAY, OCTOBER 1, 1904.

THE VALUE OF CYTODIAGNOSIS IN DISEASE OF THE CENTRAL NERVOUS SYSTEM.

During the last two years a number of articles have appeared, particularly in journals devoted to neurology, dealing with the so-called cytodiagnosis. This procedure, which is a natural outgrowth of the differential blood count, consists of a differential count of the cells in an inflammatory exudate, or in one of the natural secretions of the body, as the cerebrospinal fluid. The introduction of a test of this sort is almost invariably followed by a certain number of articles based on an insufficient number or an insufficient variety of cases, and as a result of this false though often very attractive conclusions are reached; and too many of us are too apt to accept the various claims set forth for new methods without the necessary saline flavoring.

In the case of cytodiagnosis, the most work has been done on the central nervous system by staining centrifugalized cerebrospinal fluid withdrawn by lumbar puncture. It is in diseases of the central nervous system that the procedure has been claimed to be of the greatest value. The main claims, briefly stated, of the majority of French, German and American writers, have been that an increase in the lymphocytes in the cerebrospinal fluid is pathognomonic of a meningeal irritation, and that such an increase is characteristic of the early stages of general paresis and tabes dorsalis, and of cerebrospinal syphilis.

In a recent article,[1] Niedner and Mamlock have drawn attention to some of the fallacies which are apparent in the technic and in the interpretation of the results of cytodiagnosis as it is now done. As these observers point out, if we are to compare the results of different workers with a test of this sort it is necessary to base all observations on a common technic, and so far this has not been done. A measured quantity of the fluid should be taken; it should be centrifugalized in a centrifuge having a given number of revolutions per minute, and should be left in the centrifuge for a given length of time. Further, the method of making spreads, and the method of staining should be uniform, and the technic as a whole should be as simple as possible. The present lack of uniformity of technic makes it difficult if not impossible to compare the results of different authors, and leads different observers to give different figures as normal. Thus French observers state that three or four lymphocytes in a microscopic field with a magnification of 400 diameters represent the normal, while certain German observers, as Merzbacher, state that under similar circumstances six to eight lymphocytes in the field are normal.

Up to the present the common conditions in which an increase of the lymphocytes in the cerebrospinal fluid has been observed have been general paresis, tabes, and syphilis of the nervous system. Occasionally such an increase has been found in other conditions, as herpes zoster, sciatica and parotitis. On the other hand, it has generally been stated that in functional neuroses, epilepsy, senile hemiplegia, cerebral tumor and compression myelitis no increase in the lymphocytes takes place. Niedner and Mamlock studied a large series of cases from von Leyden's clinic to determine whether they could substantiate the reported findings. They conclude that an increase of lymphocytes in the cerebrospinal fluid is not necessarily associated with parasyphilitic affections (tabes, general paresis), but that it may be due to any cause producing sufficient irritation of the meninges which lasts a certain length of time. Thus it may be due to intoxications (lues, uremia, tetanus), or to mechanical irritation from tumors or other mechanical factors causing cerebral pressure.

Simple irritation of the meninges from injury or disturbances of the circulation is not in itself sufficient to cause an increase in the lymphocytes. As to the value of the test, the authors state that they feel somewhat disappointed. The frequent appearance of lymphocytosis in lues, and its not infrequent absence in tabes, make its value in the latter disease rather problematical. While the test may be of some value in general paresis, as the lymphocytosis here is quite constant, still the diagnosis in these cases is so seldom in doubt that the test is rather a superfluity than an aid. The impression received by the work of Niedner and Mamlock is that the test has been very much overrated in the articles so far written.

1. Zeitschrift für klin. Med., vol. liv, Nos. 1 2.

PSYCHOPATHIC HOSPITALS AND CLINICS.

One of the disadvantages with which American alienists have had to contend in the past has been the inability to study and treat the acute insane and milder grades of psychoneuroses under such advantageous conditions as the surgeon and physician enjoy in caring for medical and surgical cases in city hospitals. The acute insane are sent to large state asylums as soon as legal commitment is possible, and the psychoneuroses have never been properly provided for in city clinics. They are not admitted to general medical and surgical hospitals. Strangely enough, they are not often regarded by the admitting authorities as sufficiently ill to require hospital treatment. American cities have as yet provided no special hospital for the proper care of neurologic cases other than a few infirmaries in con-

nection with almshouses. The usefulness, even of such provisions, has obviously been sacrificed by the nature of the associations and surroundings of such hospitals.

However, it looks more promising for the future. Ann Arbor and Albany already have their psychopathic wards. The last New York legislature appropriated several thousand dollars for a psychopathic hospital for New York City, and plans of construction are now in preparation. It is interesting to note with what singleness of purpose well-meaning reformers put in operation the state care of the insane. They seem to have entirely overlooked the various economic, therapeutic and scientific principles which were sacrificed in transporting all the insane from the towns and cities into large and only too often inaccessible country district asylums. On the continent of Europe the mistake of caring for the insane so far from their homes was recognized early and was in process of correction long before the state-care movement had become at all general in this country. Thus in the early sixties Griesinger pointed out the urgent necessity of forming small city hospitals and out-clinics for reception and treatment of the acute insane, to supplement the workings of the large district asylums for the chronic cases which were situated quite remote from the populous centers. Its general adoption soon followed. Germany preceded us, therefore, by at least two decades in establishing this type of hospital for the acute insane and psychoneuropathic.

Out-clinics or dispensaries have been in successful operation for several years in the German psychopathic hospitals; indeed, the great majority of the so-called functional neuroses, such as hysterias, epilepsies, chronic neurasthenics and the like, have been treated in this manner. Their ratio in the psychopathic hospitals at Giessen and Kiel has steadily increased. In the first year's opening of the hospital at Giessen in 1896, 6.5 per cent. of the total number treated in the dispensary and wards were of the psychoneuropathic class. In five years it increased to 23 per cent.

In this country the lack of proper facilities for diagnosis and treatment of such cases in general neurologic clinics has often been commented on. Clark and Montgomery[1] have included these essential out-clinic departments in their suggested plans for psychopathic hospitals in American cities. They have arranged ample out-clinic provisions for diagnosis and treatment by electricity, hydropathy, mechanicotherapy, massage and systematized movements. Out-clinics of this kind would be of inestimable value for selection of proper cases for in-ward treatment. They would reduce the fear with which the general public regards such hospitals. They would also result in lessening the necessity for so many private sanatoria which, for economic reasons at least, are only too often impossible for the poor.

1. Suggestions and Plans for Psychopathic Wards, Pavilions and Hospitals for American Cities, by L. Pierce Clark and H. P. Alan Montgomery, American Journal of Insanity, vol. lxi, No. 1, 1904.

THE PASSING OF PRIMITIVE MAN.

The disappearance of primitive man before civilization has been recently discussed in an interesting manner by Dr. F. A. Cook.[1] He says that alcohol and venereal diseases have been largely credited with the result, a conclusion which he questions, though he admits his observation has been limited to the sub-Polar races, the Fuegians, Patagonians, Eskimos and sub-Arctic Indians. He is inclined to credit as an important factor the lack of immunity of these races to the diseases of civilization, which, to civilized man, have, from long familiarity, become comparatively innocuous. The part played by such disorders as measles, mumps, whooping cough and scarlet fever in the destruction of primitive man, was to him a great surprise. Even chicken-pox is a fatal epidemic among the Eskimos, and even more severe among adults than among children. The infant mortality among the Indians is very great, and this he attributes to the introduction of new diseases by explorers, traders and missionaries Alcohol and venereal diseases come second. Lastly, he considers the destruction of savage ambition and altered conditions of life and environment as important factors leading to physical degeneration, and making the savages ready subjects for tuberculosis.

There is undoubtedly considerable truth in these conclusions. They may certainly be accepted as the deductions of a careful and trained observer in a comparatively limited field. Many will think that he underestimates the influence of alcohol as a cause of degeneration and fatality. There would be little difficulty in exterminating many native tribes by free trade in intoxicants during their hunting season with the consequent results of improvidence and later famine. Such a condition of affairs occurred some years ago on St. Lawrence Island. There is undoubtedly a great deal of truth in his theory of lack of immunity, and this would be an interesting study could it be taken up over a wider field by competent observers. If we could exterminate tuberculosis for many generations and then admit the infection, we might have a similar experience of our own.

The influence of changed environment and of contact with a higher grade of civilization generally, unattended by a higher grade of morals, is also probably underestimated by many observers. We can imagine, perhaps, a similar demoralization occurring in our own race were the presence of a vastly superior class of beings without moral restraint suddenly thrust on us. Mr. Wells' fantasy of the "War of the Worlds," even without the active extermination he portrays, would probably soon be more than realized. There is a vast difference, however, as regards racial vitality in uncivilized man, and, in some sections, with special conditions, primitive man is capable of existing and even flourishing in spite of the demoralization and disease introduced by contact with the whites. Thus in the

1. Brooklyn Medical Journal, September, 1904.

tropics the partial immunity toward malaria of some of the colored races is apparently an adequate defense, and among the Eskimos we might look for a similar partial immunity to evils of crowding and non-ventilation. This may account for the fact reported by Nansen, who has observed that while tuberculosis is not uncommon among the semi-civilized Greenland Eskimo, it is by no means always a rapidly fatal disease with them, but may exist in a readily recognizable form for years without seriously interfering with their ordinary activities and pursuits, and this notwithstanding the exposure that these involve

Primitive man, however, is rapidly disappearing under all these causes and unfavorable conditions that have been mentioned, together with many others, in most parts of the world. The desirability of careful medical studies among primitive people is, therefore, the more imperative. There is a field of study here which has been too much neglected, and in many cases the opportuity is forever lost It is to be hoped that medical explorers and even non-medical ones will give it their future attention. It may be that such a study thoroughly carried out would lead to some valuable practical deductions as regards the warding off of disease among civilized races as well.

THE GROWING NECESSITY OF COLLEGE TRAINING PREPARATORY TO MEDICAL STUDY.

For the young man who is planning to fit himself for the practice of medicine there are two possible routes: One, the longer, but admitted by all to be more nearly the ideal, involves the intervention of a greater or less length of time between the completion of the high-school course and the actual assumption of medical study, to be spent in attendance at some college or university; the other is the short cut from high school to medical school, which is recognized as practical by a large number of eminently well-conducted medical schools, although their number is steadily decreasing There can hardly be a question as to which is the better route. The question that does arise in the minds of many is, however, does it pay to give up from two to four years to college work which, in large part, may have no direct bearing on the study or practice of medicine?

There are two things that are to be obtained in a college course: One is the acquisition of certain knowledge, and this is, perhaps, what the majority of people consider the chief function of any educational institution. The other is the social training, the habit of contact with people of rather better than average bearing and education, the broadening of prospect, and the development of ideals; and it is these less material profits of college education that those most familiar with the subject will insist are really the most important. In the nature of things a medical school must be given over almost entirely to the first matter—the imparting of information. The curriculum of every school is so crowded that there is little opportunity for anything but hard work, and the student's mind has little time for play on any but the topics of his work. The hours for social contact are few, the instruction afforded is essentially narrowing, and the desire for hospital appointments and other immediate rewards holds the attention of the student fast on the one subject. The intensity of concentration and the eagerness for new information that is so characteristic of the medical student is brought out very strongly in those institutions in which medical and undergraduate students occupy the same buildings and grounds. Therefore, the medical student seldom gets much social advantage from contact with his fellow-students, and still less from the faculty, as a rule, and the student who has entered medical work in the immature condition of the high-school boy is bound to lose altogether this benefit that is conferred so well by the college. To be sure, there are some of the most broad-minded, cultured and estimable of the members of our profession who have had never a moment of undergraduate life in their career—some who have not even had a high-school education but these are brilliant exceptions. Most of us must get our polish through contact. Furthermore, it will be generally found that these are the very men who regret the lack of a college education most of all. With the rapid increase in the number of colleges and universities throughout the country, and the great growth among them all, the proportion of college-bred men and women in every community is rapidly increasing, and already they form a very considerable proportion of the generation with which the present-day medical student will live. It is certain that these college-bred people, holding the positions of trust and influence in their several communities, will constitute that portion of the society to which the physician will naturally look for his companionship and associations, and the mere holding of a degree and a title without the necessary breadth of education and culture behind it will not of itself make him acceptable to them. Success consists of a good deal besides a large income, and a professional man who is not socially recognized is seldom happy. No one would be so foolish as to insist that a college education is the *sine qua non* of social and mental success, but we know of no other aid that is so great or so satisfying in after years.

As for the advantages of the college training in the way of the addition of knowledge, there is much that could be said bearing on the relation of a full training in literature, economics and history to breadth of character and the formation of ideals, but there are also many other things of immediately practical nature First of all should be mentioned the study of French and German, without a reading knowledge of which no student should be at the present day. Then there are the fundamental conceptions of biologic science, and also geology and paleontology, which afford such excel-

lent foundations for the study of human biology and development which every student needs, but which he can not possibly get elsewhere than in college. But of most immediate concern to the teacher in the medical school is the training in methods of laboratory study. High-school laboratory work, when it exists at all, can give little training that is of the same type as should be demanded of every medical student, and affords little conception of the real meaning of the words science and research. Put together in the same laboratory two students, one of whom has had but a high-school preparation while the other has taken laboratory courses in the sciences in any good college, and the high-school student is of necessity handicapped from the start.

THE DIPLOMA-MILL BUSINESS.

According to the newspapers, not less than 20,000 people are labeled doctors of laws, letters, science or theology by diplomas bought from a young man named Farr who is, in his corporate capacity, half a dozen or more colleges and universities entitled to issue diplomas giving high-sounding degrees. If one individual can be all this and distribute 20,000 doctorates up to date, what is the output of the numerous competitors, the Buchanans, the Armstrongs, the Proberts, and all of that ilk who are also in the business? The prospect seems to be that every fool who can spend ten dollars, more or less, may become a doctor of some sort or other. Unearned honors coming cheaply are always in demand by a certain class. Fortunately, in most of the states now there is a legal restriction on medical degrees, and imperfect as the law often is it is far better than it has been.

WOOD ALCOHOL.

At the session of the American Medical Association held last June, the House of Delegates unanimously adopted the following preambles and resolution:

Whereas, The employment as beverages of wood spirit or methyl alcohol and its various preparations is known to have been responsible for numerous deaths and many cases of blindness in this country during the past few years; and

Whereas, Even the breathing of confined air charged with the fumes of this form of alcohol has been shown to produce blindness, it is

***Resolved*, That the House of Delegates of the American Medical Association, recognizing the dangerous character of wood alcohol and liquors containing it, believes that it should be placed on the list of poisons. It accordingly urges the proper federal and state authorities to take the necessary steps to protect life and eyesight from its pernicious influences.**

At the time this action was taken—on the recommendation of the Section on Ophthalmology—only a preliminary statement was ready for presentation; now, however, the investigations are complete, and we publish this week the first installment of the report of Drs. Wood and Buller[1] on the subject, which confirms all that has been claimed in the preambles and resolutions. To a large extent "Columbian spirits" and other "deodorized" forms of this deadly poison, wood alcohol, are being substituted for the innocuous, or less injurious, grain alcohol in all sorts of liquid which—legitimately or otherwise—are used by human beings. These include the medicines we use, the perfumes we smell, the condiments, sauces and flavors we employ in cooking, as well as the common intoxicating beverages. Surely, it is high time that the medical profession should voice an emphatic protest against this wholesale poisonous adulteration of food and drink—an adulteration so far confined, by the way, to the American continent—and consider whether the sale of this "deodorized," palatable and attractive poison should not be altogether prohibited.

1. See page 972.

EXPULSION PENALTY FOR EXTORTION.

A German medical society, it is reported, has recently disciplined one of its members for charging extortionate fees. Being consulted by an American millionaire for appendicitis, he recommended an operation and suggested the name of a surgeon. The latter was employed and received a liberal fee. Then the physician in question who was first consulted sent in a bill for $2,000 for his advisory services. This charge was objected to and a smaller sum offered. The physician then instituted legal proceedings, and had the American arrested and humiliated by being placed in "jail limits"—we presume a sort of unpleasant *quasi* confinement. The matter aroused public attention, and the conduct of the physician was severely condemned by press and public, and his fellow-physicians took the matter up with the result as stated. It is generally admitted by the public, as well as by the profession, that a physician's charges may vary with his professional reputation, and also according to the means of his client. There are high-priced physicians as well as high-priced lawyers, and nothing unethical is recognized in the distinction. Moreover, the scale of charges varies according to standards fixed by medical societies to fit the means of the patients. Practically, there is no limit as to contracts between physician and patient. One is at liberty to receive whatever the other is willing to pay, and one's conscience permits one to receive, and there is nothing unprofessional or unethical in large fees *per se*. When, however, as in this instance, a physician attempts to force by legal means what the public would regard as extortionate demands not corresponding to what is considered the value of his services or opinions, he is liable to receive the tacit, if not the open, condemnation of most of his professional brethren. The occurrence of such affairs and the concomitant public discussion is an unpleasant thing—a sort of scandal on the profession—and probably our German confrères followed the least regrettable course in the matter.

NIELS R. FINSEN.

In the death of Niels R. Finsen in Copenhagen, Denmark, September 24, there passed away one of the heroic figures in modern medicine. In spite of chronic and incurable disease, Finsen, with rare persistence, developed phototherapy on a strictly scientific basis so that it became definitively established as a successful means of cure in lupus vulgaris. He early recognized

that if the great forces contained in light ever could be used in the science of practical medicine it would result only from investigations of physical, chemical and biologic nature, together with practical experiments in different diseases. Apparently, his earliest publications concerning light and its action on the animal organism date from 1893. In 1896 the results of his scientific researches led to the establishment in Copenhagen, as the outcome of private and public support, of "Finsen's Medical Light Institute." Subsequently this institute, which soon became known everywhere, was greatly enlarged. In 1899 Finsen began the issue of a series of reports (Meddelelser fra Finsen's medicinske Lysinstitut) in which are published the results of the scientific and practical work of the institute. In the meantime, there appeared important monographs by Finsen in the Danish, French and German languages. Here were considered especially the rôle of the chemical rays of light in medicine and in biology and the treatment of lupus vulgaris by concentrated chemical rays. The report covering the first 800 cases of lupus vulgaris treated at Finsen's institute (November, 1895, to November, 1901) show that 407 were cured, 85 had interrupted the treatment, while 308 were still under treatment. This report may be taken as a model of thoroughness and exactness in dealing with matters of this kind; one is particularly impressed with the carefulness to avoid premature and exaggerated statements as to the value of the method. This is not the time nor the place to give any detailed account of the scientific work of Finsen and his assistants. To Finsen belongs the credit of having placed phototherapy on a firm and scientific basis. But no one must think for a moment that this was accomplished without persistent effort. In reading Finsen's writings and the publications of others working in his institute, one at once finds the keynote to be continuous extension of our knowledge of the action of light on living matter and improvements in the practical application of the chemically active rays. Finsen was ever conservative in his own estimation of the therapeutic powers of light and advanced claims which subsequently proved to be without adequate foundation. In his short but fruitful career, Finsen consistently illustrated that unselfishness and modesty which medical men love to see in their best types. He cared not for personal gain. When he was awarded the Nobel prize in medicine, in December, 1903, he generously turned the money received over to the use of the institute. From whatever side we look at Finsen and his work, there comes only the impression of a noble character.

Medical News.

CALIFORNIA.

Donation for Hospital.—The Pasadena Hospital has recently received an anonymous donation of $15,000 to be applied to the construction of a new hospital building.

New Buildings for Sanatorium.—Work has been commenced on a two-story building and a bungalow cottage to cost $30,000 for the Southern California Sanatorium for Nervous Diseases, Pasadena.

Angelus Hospital Association Will Build.—A permit was issued September 16 to the Angelus Hospital Association for the construction of two fireproof hospital buildings in Los Angeles, to cost $150,000.

One-fifth of Deaths Preventable.—In the last two years, 28,600 deaths have occurred in the state, of which 5,798, or more than one-fifth, were from preventable diseases, and especially typhoid fever. No case of plague has been reported since February.

Personal.—Dr. Frank S. Woolsey, Berkley, has been appointed physician of Alameda County, vice Dr. Hubert N. Rowell, resigned.——Dr. Dwight H. Trowbridge, Fresno, has returned from Europe.——Dr. Rae Felt, Eureka, was injured in a wreck on the New York Central Railway at Lyons, N. Y., September 25.——Dr. James H. Todd has been re-elected president of the Oakland Board of Health.

Restrictions of State Health Board.—Dr. Newel K. Foster, Sacramento, secretary of the State Board of Health, in his report to the governor, says that while the law imposes important duties on the board, it bestows little power, as it does not oblige local boards of health to answer interrogations from the state board, does not allow enforcement of proper measures to protect life and health, gives no means for eradicating causes of diseases and epidemics or for the dissemination of information to the people save through the good will of the press.

CONNECTICUT.

Bequest.—By the will of the late Mrs. Ruth Ann Adkins of Winsted, the residue of the estate, after the payment of legacies, is devised to the Litchfield County Hospital. The value of the bequest is about $15,000.

Infectious diseases were reported during August as follows: Measles, 15 cases in 7 localities; scarlet fever, 44 cases in 17 localities; cerebrospinal fever, one case; diphtheria, 86 cases in 22 localities; whooping cough, 6 cases in 3 localities; typhoid fever, 173 cases in 47 localities, and consumption, 18 cases in 6 localities.

Personal.—Dr. Edward S. Brackett, Hartford, has been appointed surgeon of the schoolship *Philadelphia*, which is about to take a trip round the world.—Dr. Franklin H. Mayberry, East Hartford, has been nominated for state senator.——Dr. L. Z. Skinner, Windsor, has been appointed assistant professor of anatomy in the medical department of the University of Illinois.

August Deaths.—During August 1,362 deaths were reported, 46 less than in the preceding month, 33 less than in August, 1903, and 53 less than the average of August for the five years preceding. This is equivalent to an annual mortality of 17 per 1,000. The principal causes of death were diarrhea, 361; diseases of nervous system, 136; consumption, 123; heart disease, 104; and violence, 86.

GEORGIA.

Personal.—Dr. Thomas H. Hall has been elected city physician of Dublin.

Journals Consolidated.—The editor of *Southern Medicine* announces the consolidation of that journal with *Gaillard's Medical Journal*, beginning with the October issue.

Health Department Appropriation.—Augusta has appropriated an additional sum of $2,400 for the health department, $1,200 of which is to be used in betterment of the isolation hospital.

National Guard Surgeons to National Meeting.—The governor has detailed the surgeon general, Col. Joseph A. Guinn, Conyers; Majors Floyd W. McRae, Atlanta, Joseph G. Jarrell, Savannah, Olin H. Weaver, Macon, Charles J. Montgomery, Augusta, and Andrew H. Hilsman, Albany, and Lieutenants James M. Kelly, Griffin, Guy Chappell, Dawson, John M. Spence, Camilla, and Sam H. Greene, Atlanta, as delegates to the Association of Military Surgeons of the United States, which meets in St. Louis, October 10 to 15.

IDAHO.

Society Meets.—The South Idaho District Medical Society met at Idaho Falls, July 2.

Hospital at Coeur d'Alene.—Plans are nearly completed for a hospital building to be erected at Coeur d'Alene lake on the water front, by Dr. W. W. Webb.

Smallpox Death.—A patient who had been ill with smallpox for two weeks at Mahon's Mill on Lake Creek, died, principally, it is said, from want of proper care and attention.

In Prison for Shooting.—Dr. James W. S. Emerson, Milner,

has been sentenced to two years' imprisonment in the state penitentiary for shooting and seriously wounding his wife last autumn.

ILLINOIS.

Hospital Incorporated.—Baptist Hospital, Woodstock, has been incorporated, with a capital stock of $10,000.

Personal.—Dr. Howard Kelly, Baltimore, was the guest of honor at a dinner in Peoria, September 22, at which Dr. Clifford N. Collins presided.——Dr. Elijah A. Morgan, Decatur, has retired from practice on account of ill health.

Hospital Planned for Oak Park.—A hospital "built by Oak Park people, and managed by Oak Park people for Oak Park people" is planned. Dr. John W. Tope is the chairman of the incorporation committee. The projectors expect to erect a building to cost $125,000, with separate isolated and maternity buildings.

Illinois Suitable for Consumption Cure.—The Illinois State Board of Health has issued a third revised edition of its circular on the "Cause and Prevention of Consumption," which was published in July. In this circular Illinois is commended as a suitable place for the treatment of consumption, and attention is directed to climatic conditions, elevation and soil, which is equally as good as, and in some instances superior to those found at the famed tuberculosis sanatoria of Massachusetts, New York and Pennsylvania. The sections on the care of the consumptive, prevention of consumption, and consumption in schools, contain much new information. Within the last few weeks $10,000 has been offered to the board, to be utilized in the construction of a consumptive hospital.

Chicago.

Bequests to Hospitals.—By the will of Mrs. Elizabeth G. Kelly the Home for Incurables receives $60,000; the Presbyterian Hospital, $25,000, and St. Luke's Hospital a liberal sum, the amount of which is not yet announced.

Personal.—Dr. George F. Butler has severed his connection with Alma Sanitarium and will resume practice in Chicago.——Dr. John L. Sweeny has returned from Europe.——Dr. and Mrs. Daniel R. Brower have returned from the west.——Dr. Norval H. Pierce has returned from a summer in Europe.

Mortality for the Week.—In the week ended September 24, 457 deaths were reported, 14 more than in the previous week, and 41 less than in the corresponding week of 1903. This is equivalent to an annual death rate of 12.36 per 1,000. Acute intestinal diseases caused 81 deaths; consumption, 63; violence, 42; heart disease and Bright's disease, each 34, and pneumonia, 32.

Antitoxin Stations Opened.—The department of health has established antitoxin stations at 7 drug stores on the north side; 14 on the south side; and 19 on the west side, at which diphtheria antitoxin can be obtained at the following prices: 1,000 units 75 cents, 2,000 units $1.25, 3,000 units $2.25. The department supplies culture outfits and makes a diagnosis of diphtheria free for all physicians who apply. They advise all physicians to make a culture and send it to the laboratory in every case of "sore throat," whether they suspect diphtheria or not, "because it is well known that it is practically impossible to diagnose diphtheria clinically in every case. If a child dies of diphtheria one of two parties is directly responsible—either the parents in not calling in a physician soon enough, or the physician for not making the correct diagnosis and giving antitoxin early enough in the disease."

Summary of Smallpox in Chicago.—During the last six years 1,241 cases of smallpox have been sent to the Chicago Isolation Hospital. Of these 1,114 never had been vaccinated; 127 had some sort of a scar said to have been of a vaccination in early life. None of these with the old marks had ever been re-vaccinated. Three experienced physicians examined these persons for evidence of vaccination, and the figures are absolutely reliable. These 1,114 cases came from the remnant of unvaccinated persons. It is probable that 90 per cent. of the people of Chicago are vaccinated, and from this source came only 127 cases, while from the remaining 10 per cent. 1,114 cases were sent to the hospital. Last year 389 patients with smallpox were sent to the hospital, 102 of whom were unvaccinated children under the school age of 6 years, 14 of whom died. This year, out of 161 cases, 52 are unvaccinated children under the school age. The children under school age are not required by law to be vaccinated, which accounts for these babies falling victims to this face-scarring and death-dealing disease. The unvaccinated children under 6 years of age, and the unvaccinated new arrivals in the city who have found employment without being required to produce a certificate of vaccination, furnished nearly all the victims. The disease has changed recently to a more virulent form, four deaths having occurred in the last fifteen days. There were but three deaths in the previous eight months. Evidence that no recently vaccinated person ever contracts smallpox is the fact that during the last six years the most recently vaccinated person to be sent to the hospital with smallpox had an imperfect mark made thirteen years previous to the attack.

MARYLAND.

Baltimore.

Opening of New Surgical Building.—The new surgical building of Johns Hopkins Hospital will be dedicated with elaborate ceremonies October 5.

College Opens.—The twenty-fourth annual course of instruction at Baltimore Medical College was opened, September 20, with an address by Dr. George Reuling.

Teachers to Examine Children.—The board of commissioners has instructed the teachers to examine the arms of all children under them for vaccination marks and report to the health department.

Need Isolation Hospital.—A fatal case of diphtheria, in which a woman was without medical attendance for a week, and was dependent on her neighbors for sustenance, again emphasizes the need of a hospital for infectious diseases.

Personal.—Dr. William Lee Howard has returned from abroad.——Drs. Isaac E. Emerson and Smith Hollis McKim arrived home from Europe September 18.——Dr. and Mrs. Charles Whittier Young will sail October 25, from San Francisco, for China, where Dr. Young will be a medical missionary.

Defects in State Lunacy Laws.—Attention is drawn to numerous defects in the lunacy laws of Maryland. Dr. Preston, secretary of the lunacy commission, says the law is unconstitutional. All that is necessary to commit any one to an asylum is the signature of two physicians to a certificate of insanity. There is no identification of the signers, no affidavit is required. "It would be an easy matter for a person to procure a blank certificate and forge the signatures of two reputable physicians to it; or he need not do that, but simply inscribe 'M.D.' after any name. I know of no instance in which this has been done, but the mere fact that it is possible under the present law is sufficient warrant for an amendment to the law." Again, the law says a person so committed "shall be confined until released by due process of law," which is legally imprisonment for life, as there is no process of law in the Maryland statute books by which an insane person can be released. The commission has endeavored to get around this by "paroling" patients who have recovered, but there is no legal warrant for it, as there should be. The last legislature passed a bill by which the state, in January, 1909, will assume the care of all insane institutions, except those in private asylums. By this law all pauper lunatics will be removed from county jails and almshouses to one of the state asylums. Dr. Preston proposes that commitment shall be made only on an order from a court of record. The judge is to order an inquiry to be made into the alleged insanity by two competent physicians. If they find insanity present they shall certify so under oath, after which the finding is to be approved by the judge, who, if he thinks proper, may order a new examination by physicians or jury, or may summon the parties before him. In case of emergency a patient may be admitted to an institution for three days, during which the examination is to be made as above. The secrecy with which the incarceration of an alleged insane person is permitted under the present statute is further said to be one of the weightiest arguments against the law, as it practically legalized kidnapping.

MINNESOTA.

Ames May Go Free.—The county attorney of Hennepin County has made a motion for a nolle of the ten indictments against Dr. Albert A. Ames, formerly mayor of Minneapolis.

August Vital Statistics of Duluth.—During the month 72 deaths and 114 births were reported. Typhoid fever caused 5 deaths; tuberculosis, 6; and violence, 16. No death from contagious disease was reported.

Anti-Spitting Crusade Extended.—The health commissioner of Minneapolis, after having conducted a successful campaign against spitting on sidewalks, has now caused to be placed in

the galleries of all the theaters of the city huge placards reading, "Don't Spit on the Floor. Fine, $5."

Hospital Notes.—The new emergency hospital at the state fair grounds, secured by the efforts of the Woman's Medical Society of Minneapolis, contains 3 wards, an operating room and several private rooms.——A thoroughly-equipped hospital was recently opened at Cass Lake.——Work on the State Sanatorium for Consumptives at Walker will be begun soon. During 1904 and 1905, $25,000 is available for the sanatorium.

NEW YORK.

Medical Staff Changes in Utica.—At the quarterly meeting of the medical staff of Utica General Hospital, Dr. Raymond L. Baker was elected a member, vice Dr. Thomas J. Bergen, resigned.

Medical Colleges Open.—The medical department of the University of Buffalo opened for the session of 1904-05 September 26.——Albany Medical College reopened September 20. Dr. Richard M. Pearce delivered the introductory address.

For Nassau Hospital.—A charity fair was held at the home of Mr. and Mrs Clarence Mackay at Roslyn for the benefit of Nassau Hospital. Mrs. Mackay has recently presented this hospital with a new ambulance complete in every detail and also with a home for nurses.

Faculty Changes.—The following faculty changes in Albany Medical College have occurred: Dr. Richard Mills Pearce has succeeded Dr. George Blumer as professor of bacteriology and pathology; Dr. H. Judson Lipes has been made clinical professor of obstetrics; Dr. Spencer L. Dawes, adjunct professor of materia medica; Dr. Wilfred S. Hale, demonstrator of anatomy and assistant curator of the museum; Dr. Edwin McD. Stanton, lecturer on histology; Dr. Howard E. Lomax, instructor in anatomy; Dr. Charles K. Winne, Jr., instructor in bacteriology; Dr. George G. Lempe, instructor in anatomy; Dr. Donald Boyd, demonstrator in anatomy of the nervous system; Dr. Edward F. Sibley, instructor in clinical microscopy, and Dr. Silas L. Filkins, prosector of anatomy.

Buffalo.

Mercy Hospital Opened.—The new Mercy Hospital was opened with appropriate ceremonies September 24. Bishop Cotton made an address.

Returned.—Dr. W. Harry Glenny has returned from Muskoka.——Drs. George W. York and Charles H. Stadlinger have returned from California.——Dr. James W. Putnam has returned from St. Louis.——Dr. Bernard Bartow has returned from Wanakah.

Crusade Against Insanitary Bakeries.—Health Commissioner Greene has started a crusade which has for its object the bringing of every bakery in the city into a sanitary condition. Hereafter every baker will be required to obtain a permit from the health department before securing a license from the mayor. This will bring the bakeries under direct supervision of the health department and the department will thoroughly inspect the bakeshops at regular intervals.

New York City.

Dinner to Semon.—Invitations have been issued to a dinner to be given by the Section on Laryngology of the New York Academy of Medicine on November 1 to Sir Felix Semon of London.

Contagious Diseases.—There were reported to the sanitary bureau for the week ended September 24, 305 cases of tuberculosis, with 145 deaths; 224 cases of diphtheria, with 16 deaths; 93 cases of typhoid fever, with 21 deaths; 58 cases of scarlet fever, with 4 deaths; 43 cases of measles, with 4 deaths; 2 cases of smallpox, 3 of varicella, and 19 deaths from cerebrospinal meningitis.

Protest Against Carbolic Acid Ordinance.—Health Commissioner Darlington has given a hearing to a number of druggists on their protest against the new ordinance forbidding the sale of carbolic acid in other than a weak solution without prescription. The druggists claim that it would not lessen the number of suicides, as such persons would seek some other remedy, and that the five per cent. solution would be as deadly in effect if it were taken in sufficient quantity. Dr. Darlington declared that his investigations of carbolic acid suicides for the past several months showed that in 42 per cent. of the cases the acid was procured in drug stores without any difficulty.

OHIO.

Dr. Scott Stricken.—Dr. Xenophon C. Scott, Cleveland, was stricken with apoplexy while making a professional call, September 15, and is in a serious condition.

Hyndman's Successor.—Dr. Albert V. Phelps has been chosen to succeed the late Dr. James G. Hyndman as secretary of the faculty of Ohio Medical College, Cincinnati.

Memorial to Dr. Buechner.—The Mahoning County Medical Society devoted its meeting of September 20 to a consideration of the life of its late honored member, Dr. William L. Buechner, Youngstown.

Personal.—Dr. Amanda H. Miller, Cleveland, has returned from Europe.——Dr. John P. Kenny, Youngstown, is ill with diphtheria.——Dr. Frederick W. Lamb has been appointed to succeed Dr. William Muehlberg on the staff of the Cincinnati City Hospital.——Dr. Charles L. Harmer has resigned from the staff of the Massillon State Hospital, Drs. J. D. O'Brien and D. E. Harris have been promoted from internes to assistant physicians, and Dr. H. F. Vaughan has been promoted from druggist to assistant physician.

Colleges Open.—Dr. Starling Loving, Columbus, opened the fifty-eighth session of the Starling Medical College with a clinical lecture, September 14. Additions to the teaching force are: Dr. Sissons in the department of anatomy; Dr. Clement Jones in biology and embryology, and Dr. Sterling B. Taylor, demonstrator of anatomy, vice Dr. Louis Kahn.——Toledo Medical College opened for its twenty-fourth annual session, and its first session as a department of the Toledo University, September 22.

PENNSYLVANIA.

Personal.—Dr. John P. McCord, Pittsburg, has been elected surgeon general of the Union Veteran Legion.——Dr. and Mrs. James M. Anders, Philadelphia, have returned from an extended visit in Europe.

Smallpox in Pottstown.—Smallpox continues and is apparently on the increase in Pottstown, and general vaccination is to be carried out. An order has been issued preventing all pupils who have not been successfully vaccinated from entering the public schools.

Diphtheria in Chester Schools.—Since the opening of the public schools in Chester several cases of diphtheria have been discovered among the pupils. The disease is scattered throughout the city, and the authorities claim that the epidemic is due to weather conditions, and not to any sanitary defects in the buildings.

Asks Increased Powers.—The State Board of Medical Examiners has prepared a bill which will be introduced at the next session of its legislature, giving the board the power to cancel any license issued by it whenever it appears that the holder is not a fit person to be so licensed because of lack of education or unsatisfactory professional and moral character.

New Pittsburg Hospital.—St. Joseph's Hospital, Pittsburg, was opened for public inspection September 20. The first floor of the building is devoted to the administrative department, dining room, kitchen, etc.; on the second floor are the medical and surgical wards and the operating room, and the third floor is used for dormitories for the nurses and resident hospital staff. The staff consists of Drs. Otto Gaub, John P. Saling, M. L. Schoenfeld, Benjamin B. Wood, Alexander R. Hampsey, Thomas P. Cochran, Charles H. Hertzog, Christopher C. Hersman and G. Arthur Dillinger.

Philadelphia.

Public Baths.—The 16 public bath houses maintained by the municipality have been closed for the season. During the season 4,725,142 persons, including 3,525,736 boys, 1,072,941 men, 98,952 girls, and 27,513 women made use of the baths, an increase of 734,525 over the bathers of last year.

Smallpox Hospital Closed.—The smallpox building of the municipal hospital has been closed and thoroughly fumigated. This is the first time in five years that the building is without an occupant. The freedom of the city from the disease is attributed to universal vaccination, and this is to be continued by house-to-house visitations during the entire winter.

Brunton and Liebreich in Philadelphia.—Sir Lauder Brunton, F.R.S. London, formerly lecturer on therapeutics in St. Bartholomew's Hospital, London, and Prof. Dr. Oscar Liebreich, professor of pharmacology in the University of Berlin, addressed the students of Jefferson Medical College, Friday, September 30, and were entertained at dinner by Dr. Hobart A. Hare in the evening.

Health Report.—The typhoid situation is much improved. The number of new cases reported for the week was 97. This is a decrease of 37 over the preceding week. In all 186 cases of contagious disease were reported, with 23 deaths, as compared with 234 cases and 27 deaths for the previous seven days. The general death rate remains low, and the deaths from all causes for the week aggregated 401, a decrease of 7 from those of last week and a decrease of 9 from those of the corresponding period of last year; 51 deaths resulted from tuberculosis.

Medical Colleges Open.—The medical department of the University of Pennsylvania opened for its 139th session September 30. The exercises were held in the new laboratory building, and Dr. John H. Musser delivered the address.——Hon. William Potter, president of the board of trustees, delivered the address at the exercises, which marked the opening of the 80th annual session of Jefferson Medical College, which were held in the new college building, September 26.——The Medico-Chirurgical College of Philadelphia held its 23d annual opening exercises September 28. Dr. Judson Daland delivered the address of the evening.——The 55th session of the Woman's Medical College of Pennsylvania was opened September 21. Dr. Clara Marshall, the dean, delivered the opening address.

TENNESSEE.

College Opens Later.—Tennessee Medical College, Knoxville, will open for the year, November 1, a month later than usual.

Epidemic Disease.—There are three cases of smallpox in Grundy County at Coalmont. All necessary precautions have been taken.——Sumner County is reported to have an epidemic of scarlet fever. Three cases have been found at Portland, 2 at Fountain Head and 9 at Grabeall, with one death. Schools have been closed.

Personal.—Dr. William A. Duncan, Nashville, has passed the examination for admission to the medical department of the Army, and is ordered to report for duty in Washington, October 1.——Dr. Z. D. Massey, Sevierville, is unopposed as candidate for state senator from the fourth district.——Dr. John P. Bates, St. Bethlehem, has been appointed a member of the sanitary staff of the Isthmian Canal Commission, and left for his post of duty, September 20.

TEXAS.

Personal.—Dr. Joseph S. Wooten, Austin, is seriously ill with typhoid fever.——Dr. Thomas M. Colley, a retired physician of Palestine, was run over by a buggy, September 15, and seriously injured.

Yellow Fever Kept Out.—The U. S. Public Health and Marine-Hospital Service and the state health authorities of Texas have succeeded in preventing the introduction of yellow fever across the American border from Mexico. Last year the disease managed to get into some of the American towns on this side of the border. New Orleans quarantined against a number of Texas points, and the state health boards of a number of southern states took the matter up. The work this year has been directed toward extermination of mosquitoes along the border, and has been quite successful. Mexicans and Americans have joined in doing all they could to prevent yellow fever getting a foothold in this country this year. So far there has not been a single case in the country.

WASHINGTON.

Tacoma's Health.—During August 54 deaths occurred, equivalent to an annual death rate of 9.96 per 1,000. Three cases of consumption, 4 of smallpox, 3 of measles, 20 of typhoid fever, and 2 of diphtheria, were reported during the month.

Medical Building for Seattle.—Local physicians and capitalists are to erect a ten-story building, to cost $200,000, to be occupied exclusively by physicians, and to be known as the Medical Building. The lower floor will be occupied by a prescription drug store and a medical supply house.

School Children Inspected.—For the first time in the history of Everett, thorough inspection of school children was made, September 7, by physicians of the department of health. Two suspicious cases were found, and the children sent home.——Medical inspection of Seattle school children began September 6.

WISCONSIN.

Healthy Milwaukee.—During August 330 deaths were reported, equivalent to an annual death rate of 11.95 per 1,000. Tuberculosis caused 30 deaths; organic heart disease, 29; violence, 17, and diarrheal diseases, 75.

Physician Enjoined.—Dr. L. W. Zochert, Hingham, has won his suit against Dr. J. H. Blekking, of that village, whose practice he recently bought out, with the condition that Dr. Blekking would not practice medicine in neighboring towns. The latter resumed practice, however, and Dr. Zochert brought suit against him. The judge granted an injunction against Dr. Blekking.

Milwaukee Colleges Open.—Milwaukee Medical College opened for the first session of its second decade September 20. Dr. William H. Earles delivered the address of welcome, and Dr. William G. Doern, formerly of Fort Madison, Iowa, the newly-elected professor of anatomy, the formal address of the evening.——The opening exercises of the Wisconsin College of Physicians and Surgeons were held September 20. Dr. Arthur J. Patek delivered the address to the matriculants.

Health Teacher Fined.—"Dr." Mak, claiming to hail from Colorado, but who also says he has been a "health teacher" in Wisconsin for many years, was fined $50 and costs, or sixty days in jail, September 3, on the charge of practicing without a license in Ashland. The sentence was suspended twenty-four hours, to give him time to get out of town. With a view, however, of protecting the citizens of Wisconsin, notices have been sent to cities throughout the state notifying the authorities to be cautious and to see to it that "Dr." Mak does not attempt to practice medicine in their vicinity.

GENERAL.

Mississippi Valley Medical Association.—The thirtieth annual meeting of this society will be held at the Grand Hotel, Cincinnati, October 11-13.

Hospital for Manila.—The Board of Health of Manila and the Secretary of the Interior have approved plans for a building to be used as a civil hospital, on the grounds on Calle Padre Faura, known as the exposition grounds.

American Neurological Society.—At its annual meeting at St. Louis this society elected the following officers for the ensuing year: President, Dr. Z. W. Spiller, Philadelphia; vice-presidents, Drs. Philip Zenner, Cincinnati, and William Lullard, Boston; secretary, Dr. T. M. Hammond, New York City. Philadelphia was selected as the meeting place for 1905.

New Hot Springs.—The United States government is preparing to spend $600,000 in improving the reservation and park at Sulphur Springs in the Chickasaw nation, I. T., for the purpose of making a second Hot Springs similar to the famous Arkansaw resort. It is to be maintained by the government in the same manner as is Hot Springs, Ark., but will be even more beautiful and picturesque. There are three groups of springs and abundant fresh water of good quality in sufficient volume for city water supply.

Sanitary Conditions in Panama.—An interesting feature of the sanitary work of the canal zone consists of what is known as "mosquito engineering." Owing to the heavy and intermittent rains, anopheles abound. Breeding places have been found in the Ancon grounds at Colon, where the hospital is situated, and all the collections of water contain the larvæ. One of the worst localities in Culebra, where the actual work of excavation is going on and malaria is very prevalent among the laborers. In order to prevent smallpox an ordinance regarding vaccination has been promulgated by the chief medical officer.

Luncheon to World's Fair Visitors.—A luncheon was tendered the delegates of the biologic and medical sections of the International Congress of Arts and Science by the faculty and staff of teachers of the medical department of Washington University, Sept. 21, 1904. Among an attendance of 100 the following eminent men participated: Theobald Smith, Harvard University; Oskar Hertwig, Berlin; Yves Delage, member of the Institute of France; Wilhelm Waldeyer, Berlin; S. J. Meltzer, New York; Max Verworn of Göttingen; Pierre Janet, College de France, Paris; Morton Prince of Boston; William Osler of Johns Hopkins; William T. Councilman of Harvard; William T. Sedgwick, Massachusetts Institute of Technology; Ronald Ross, Liverpool; Ludvig Hektoen, Chicago University; Johannes Orth, Berlin; Sir Lauder Brunton, London; Frederick C. Shattuck, Harvard; T. Clifford Allbutt, Cambridge; William S. Thayer, Johns Hopkins; L. F. Barker, Chicago; Shibasaburo Kitasato, University of Tokio; James J. Putnam, Harvard; Charles L. Dana, Cornell University; Edward Jackson, Denver; George M. Gould, Philadelphia; Sir Felix Semon, London;

Theodor Escherich, Vienna; Abraham Jacobi, New York; John H. Musser, Philadelphia; William B. Northrup, New York; R. A. Reeves, Toronto; William H. Welch, Johns Hopkins.

Cancel Charter of a Fake Medical College.—On two or three occasions THE JOURNAL has referred to a diploma mill that has been in active operation in Guthrie, Oklahoma, under the title of "The Twentieth Century Physio-Medical College." Last week a suit was filed in one of the district courts of Oklahoma Territory by the attorney general of the territory against this college to have the charter canceled. The petition for the revocation of the charter states that the concern was organized by H. Warner Newby, C. A. Newby and M. E. Newby, and that it was for the purpose of carrying on an educational institution for the conferring of degrees, etc.; "that instead of conducting the institution as a medical college it has been fraudulently used for illegal means of issuing diplomas, and that instead of issuing these as a result of a legitimate course of study, the diplomas were sold at wholesale." The institution was at one time sending out circulars, not only from Guthrie, but from a little town in Pennsylvania, and through the efforts of THE JOURNAL the postal department undertook to get a case against it, but those connected with the Pennsylvania end of the concern discovered that they were being investigated and stopped. Beside the Twentieth Century Physio-Medical College, the same individuals were conducting the "Twentieth Century Health Association," which, according to their circular, was incorporated under the laws of Oklahoma. Of this concern Calvin D. Gully was president, and H. Warren Newby secretary. Ostensibly, this association was organized "to advance the cause of liberal medicine and the mutual protection of members of our association, and to form a stronger combination, where all can be benefited and have legal protection wherever they wish to go." The real object, however, appears farther down in the circular, where it is stated that the shares are $10.00 each, and each member of the association holding one share "will receive a large, handsome certificate, with a beautiful seal and ribbons, which will be a fine ornament to your office. We wish the co-operation not only of the physicians of the association, but every healer and every good citizen in the country. . . . Every one who sends $10.00 will receive one of these handsome certificates, 19x28 inches, as fine as any diploma you ever saw." To show the connection of the Twentieth Century Health Association and the concern against which legal steps are now being taken, a footnote in the circular says: "Graduates of the Twentieth Century Physio-Medical College, Guthrie, O. T., can practice anywhere in the United States."

CANADA.

Hamilton Supports the National Sanitarium.—The Hamilton Branch of the National Sanitarium Association has recently contributed $1,000 toward the maintenance of patients in the Hamilton and Wentworth County Pavilion of the Muskoka Free Hospital for Consumptives. This makes $4,000 received from Hamilton altogether for the support of their consumptive poor.

Personal.—Sir Lauder Brunton was recently the guest of Professor McPhedran of the University of Toronto.——Prof. William Osler has been visiting in Montreal and Toronto.——Dr. Charles O'Reilly, medical superintendent of the Toronto General Hospital, has been elected vice-president of the Association of Hospital Superintendents.——Dr. Brefney O'Reilly, Toronto, has been appointed surgeon on the C. P. R. steamship *Tartar*, and has gone to Vancouver to assume his new duties.——Dr. H. A. Bruce, one of Toronto's leading surgeons, and who was recently operated on for appendicitis, is rapidly recovering.

To Quarantine All Inebriates.—A meeting of those interested in the treatment of inebriates was held at Government House, Toronto, September 19, Premier G. W. Ross being in the chair. Dr. T. D. Crothers, Hartford, Conn., delivered the principal address, outlining a system for the care and treatment of inebriates. Dr. A. M. Roseburgh, Toronto, told what had been done in Toronto and the province of Ontario. Professor McPhedran of the University of Toronto introduced a resolution to the effect that the time was now ripe for the formation of a society for the reform of inebriates. This was carried and another meeting will be held soon to organize.

Vancouver Hospital.—The report of the house surgeon of the Vancouver General Hospital for August shows that there were 58 in residence at the beginning of the month, and that 37 were admitted during the month. Eighty-one were discharged as cured, three died and sixty-one remained at the end of the month. The number of hospital days was 1,810. The special committee appointed regarding the medical staff reported as follows: That the active staff be composed of 12: Drs. Johnston, S. J. Tunstall, W. D. Brydone-Jack, Weld, Langis, Poole, Drier, Monro, Boyle, R. E. McKechnie and Mills, with one to be appointed by the directors. The following will compose the consulting staff: Drs. D. H. Wilson, Lefevre, McGuigan, Carroll and Underhill.

Montreal General Hospital.—The regular quarterly meeting of the Montreal General Hospital was held last week, when it was decided to alter the constitution so as to leave the medical board free to engage the officers of the resident medical staff from outside of the British dominions. The clause now reads: "No person shall be eligible as resident medical officer unless he is a graduate or licentiate in medicine of some university or college approved by the medical board." The following is the medical staff for the ensuing year: Drs. J. L. Robinson, J. C. Fysche, W. G. Bicker, J. A. Nutter, L. L. Reford, W. W. Kerr, H. G. Wood, R. B. Forbes, A. C. Rankin and W. E. Ainley. Dr. J. Alex. Hutchison read the medical report for the past quarter which showed that 781 patients were treated to a conclusion. There were 67 deaths, of which 26 occurred within three days of admission, making the mortality for ordinary hospital cases 5.5 per cent. In the out-door departments there were 9,072 consultations.

FOREIGN.

Sanitation in Mexico.—President Diaz, in his annual message, reports the gratifying result of the sanitary campaign against yellow fever, and states that there has been no recurrence of the disease in epidemic form during this year.

Spanish Red Cross Society.—It is reported that the Spanish Red Cross Society voted to send 25,000 pesetas ($4,750) to aid the Japanese branch of the society. It was proposed to send an equal amount to the Russian branch, but the proposal was rejected almost unanimously.

Gen. Kuropatkin's Gifts to Medicine.—The Military-Medical Academy at St. Petersburg has recently installed a portrait of its honorary member, General Adjutant Kuropatkin, in the main hall as a token of gratitude for his gifts. The academy owes to him the remodeling and enlargement of several of its scientific departments and institutes.

Bubonic Plague.—A recent issue of the public health report of the Marine-Hospital Service records cases of plague in widely separated localities. The disease is present in several towns in Cape Colony and in other parts of Africa. An outbreak of plague is reported from Brazil; in Rio de Janeiro ten new cases were reported in one week.

Public Disinfection in Spain.—A decree has just been issued in Spain ordering undertakers to disinfect the room after a death. The *Siglo Medico* comments on the importance of the decree, especially for the homes of the poor, as the neighbors flock to the funeral, unmindful of danger even in cases of diphtheria, smallpox, tuberculosis, measles or other disease. The authorities order that the disinfection shall be undertaken as soon as the undertakers are notified. Our exchange, however, expresses the fear that the decree will be practically a dead letter, like so many of its predecessors.

The German Training School for the Disinfection Service.—The authorities in Prussia organized last year a number of training schools to fit persons for the public disinfection service. Fourteen have been in operation, each giving a course of at least nine days altogether, and restricting the students at each course to ten. Sixty courses have been given in all, with a total attendance of 601; 585 have passed all the tests and been duly qualified as "graduate disinfectors." The authorities have been so much pleased with the results accomplished that they are urging physicians to call the attention of suitable persons to these courses and advocate their attendance. It is hoped that every district will have one or more of these expert disinfectors residing in it. Special courses for nurses are also planned. It is found that the disinfection service has gained immensely in efficiency in the hands of the graduates of these schools.

To Divert the Young from the Medical Profession.—A circular has been sent by the organized medical chambers of Germany to the high schools, warning the graduates from entering on the study of medicine. A number of these circulars were thus placed in the hands of the principals of 482 academic and

V 4
190

131 technical high schools, with the request that they would distribute them among their pupils. The overcrowded condition of the profession is set forth and the pecuniary stress of the majority of the members, due to overcrowding, to contract practice and to the lack of legislation against the irregular practice of medicine. The circular further cites statistics to show that 31 per cent. of all the physicians in the Brandenburg-Berlin district have an income of less than $750. In Berlin alone more than $5,000 had to be distributed to needy physicians during 1902, and in Bavaria 23 physicians in 1902 and 20 in 1903 had to be assisted. In 1901, 138 physicians, 1,387 physicians' widows and 390 orphans were partially supported, and many others who needed assistance refrained from applying for relief. The Berlin Medical Chamber often has occasion to help needy physicians or their widows to obtain positions in libraries or the like. On the other hand are to be considered the scant consideration accorded to the physician in these days and the hardships of a doctor's life. "In addition to all this," the circular concludes, "long years must pass after entering the university before the candidate for the medical profession can even begin to support himself by his practice."

Correspondence.

The Danger of Giving Certificates of Physical Disability to Beggars.

MUSCATINE, IOWA, Sept. 26, 1904.

To the Editor:—A few days ago a man came into my office and asked that I give him a certificate as to the condition of his heart. He told me that he was on his way west to his family and that he was out of money, in a serious condition and was soliciting aid. I examined him and diagnosed aneurism of ascending aorta with mitral insufficiency. He stated that his trouble dated from last February, and that he had been before the medical class at Ann Arbor, Mich., and some other college, and had been told that he could not live long, and had certificates from a number of physicians in good standing. His case was so interesting from a medical standpoint, per auscultation, that I called in a nearby colleague, Dr. A. J. Oliver, who examined him and concurred in my diagnosis, and we signed a certificate to the effect that he had a serious circulatory lesion, but we made no recommendation for charitable assistance. He thanked us for the certificate and went out on the street, where he had a phaeton with a couple of pillows to prop him up and a boy to drive him about. He would stop in front of a business house or office, call out the proprietor, tell him his hard luck story, show his certificate and solicit cash. In this manner he worked the business district with excellent success until he was found to have forged a prominent business man's name to his subscription list for the influence it would have, and the police ordered him out of town. We, of course, were questioned as to our motive in giving him a certificate. While the man is physically a wreck his charitable motive appears questionable. He certainly would not have to solicit in many places as successfully as here until he could travel across the continent in a parlor car. Is he a charitable fraud? He gave his name as Z. V. Good and is a man about 40 years of age, with a conspicuous scar over left orbital bone.

T. F. BEVERIDGE, M.D.

[NOTE:—Newspaper accounts show that this man operated the same scheme in Cedar Rapids.—ED.]

Life Insurance Examinations.

DES MOINES, IOWA, Sept. 20, 1904.

To the Editor:—In the issue of September 3 Dr. O. A. Rea mildly rebukes the Des Moines physicians for adopting a fee-bill providing for minor charges of $2 for day visits while a minimum of only $2 is charged for life insurance examinations.

Permit me to say that I believe his conclusions regarding low fees for life insurance examinations are well founded. A typographical error, however, made the item read $2 to $5 for day visits, instead of $2 to $3, as provided.

The doctor's remarks might lead one to believe that the fees for life insurance examinations have been reduced, which is far from being true. On the other hand, the minimum fee has been advanced 100 per cent. A number of fraternal societies doing business here, and in other states, have a fixed rate of $1 per applicant, which includes, beside a general examination, a chemical urinalysis. Some certificates of health have been issued by physicians to certain societies for even less than $1, which all must admit is deplorable in the extreme.

While I would not compare the services of the physician to his patient in a matter which concerns the health, or even the life of the latter, to the business proposition relating to a life insurance policy, as does Dr. Rea, it is, nevertheless, true, as the doctor remarks, "beneath the dignity of the profession of medicine" to accept the paltry fees proffered by certain societies and corporations for medical examinations on which the very life of the institutions depend.

A. P. STONER, M.D.

The Medical Profession and the French Chamber of Deputies.

PARIS, Aug. 28, 1904.

My previous letter from here related chiefly to the medical profession as represented in the Senate of France. I have since had an opportunity to investigate some of the facts relative to similar representation in the Chamber of Deputies. This is the popular branch of the French Congress; its members are elected by direct and universal suffrage; each deputy must live in the arrondissement from which he is elected, and, consequently, can not represent two constituencies at the same time, and each chamber, or legislature, as it is called in France, is elected for a period of four years. The basis of representation is one for each 100,000 inhabitants, with an additional representative for each additional 100,000 or fraction thereof. In such instances an arrondissement is divided into circumscriptions like that of Dordogne, for instance, which sends six deputies. The body thus chosen consists of 561 members, of which, in the present legislature, fifty-one are representatives of the medical profession.

It is very interesting indeed to study this body of professional men, particularly when one object of that study is to compare the French with the American profession in their relation to the public life of the respective countries. The first fact, by no means a surprising one, that impresses the student of political affairs in France is the marked evidence of individualism that is displayed in the multiplicity of parties. These exist in such number and with such minor variations of title that, in many instances, their differences can be but little else than doctrinaire, if not metaphysical. No one but a student, native to the soil and an active participant, could split terms with sufficient precision to clear up the mêlange of definitions. Nor is it necessary for our purpose. We can see how the medical men are moving by recounting the titles they have given themselves as candidates before their respective electorates. Thus, of the one more than a half hundred medical deputies, twenty-one inscribe themselves as "Republicain Radical"—which, despite the contradiction of terms, is really the conservative wing of the republican movement; thirteen are "Radical Socialiste," which, I am advised, is the really radical party, standing as it does for everything that is embraced in the socialistic program. After this general classification we get into a bewildering maze, in which we find four of our professional colleagues known as "Republicain Progressistes"; a similar number simply as "Republicain"; two as "Republicain Liberal"; and one each as "Republicain Collectiviste," "Radical," "Radical Democratique," "Socialiste Revisioniste," "Socialist," "Conservateur," and one as "Socialiste Blanquiste," whatever in the world that may mean. No name of a physician occurs under such classifications as "Royaliste," "Droit," "Droite Plebiscitaire," "Rallie," "Republican Catholique," or "Plebiscitaire Antisémite," groups which, in the aggregate, make up the clerical party as opposed to the government in the present controversy with the Vatican, and which stands, in one form or another, for everything in the *status quo ante* of 1870.

If this extraordinary manifestation of individualistic activity were restricted to the medical members the prospect for the

medical profession would be hopeless. But be it remembered that each of these particular classifications represents an idea or a group of ideas for which its adherents stand before the people and in the legislature. Members of the chamber are thus segregated into little groups made up of representatives of various professions and callings. It seems to be impossible, in France, in the absence of a national crisis, to get the people marshalled into two great groups for the settlement of equally great issues. Such a crisis has been presented in the movement to which I have alluded, headed by Minister Combes—a physician—in breaking off relations with the Vatican. In this crisis practical politics has prevailed to such an extent that essentially all of the groups represented by the medical men, have co-operated under the title of *"le bloc."* Aside from emergencies such as this, however, it is comforting to be assured, as I have been repeatedly, by members of the profession in and out of the French Congress that in all matters relating to public health or to medical policy, the medical members have been and are co-operative without reference to variations in state and doctrinal views.

There are other facts, however, that strike one as both interesting and important. Thus, as I noted in my study of the French Senate, it is observable that deputies have generally served an apprenticeship in minor political offices, as mayors or members of cantonal councils, while the talismanic insignia is "'70," relating as it does to participation in the fatal war against Germany. But that war, which brought the doom of the empire, brought, likewise, the opportunity of the republic, and the physicians, close to the people, knowing their wants and necessities as no body can know them, were the Republicans of that day as they are of this. Their vantage ground of observation gave them in France, as it gives us in America today, the knowledge by which to speak understandingly on economic and other questions that are beyond settlement by those who are interested disputants.

Where one finds a physician serving as deputy one is very apt to find another medical man representing another circumscription of the same arrondissement. Dordogne sends a delegation of six to the Chamber of Deputies, four of them being physicians, while there are two out of six from Puy-de-Dome; two out of four from the Haute-Loire; two out of five from Correze; two out of nine from Saône-et-Loire, while out of the delegation of fifty from the department of the Seine (Paris) five are physicians. There are other important constituencies, too, that are represented by medical men in the Chamber of Deputies, among them being Mâcon, Grenoble, Bordeaux, Lille and Lyon. Medical representatives come, also, from the mountainous districts of the Haute-Savoie, the Hautes-Alpes and the Hautes-Pyrenees, as well as from the teeming valleys of the Marne, the Siene, the Rhone, and the Loire.

Occasionally we hear that one physician has defeated another, showing that candidacies by opposing parties have been assumed by representatives of the profession, which is thereby assured of representation without reference to the partisan results of the election—a policy which has already been urged on our own profession by the National Legislative Committee of the American Medical Association. Until this policy is acted on by the medical profession generally throughout the United States it will not be in position to protect either its own interests or the general social interests which, in the evolution of the community and the state, have become its natural and sacred charges.

However, what about these medical deputies in a personal and professional sense? Are they mere politicians of the pot-house variety or are they men of real respectability in their respective communities, and of real worth in their profession? Well, to begin with, we have Barrios, who has served as a member of his municipal council, and is to-day not only a professor of the medical faculty of Lille, but is a medical writer of force and influence; Villejean, although representing the arrondissement of Tonnere, in the department of Yonne, was a former interne of the hospitals of Paris, is now professor *agrégé* to the faculty, and is a member of the staff of the Hotel Dieu; Borne, deputy from Doubs, has written effectively on "Pleurisy and the Neuralgias"; Dron, from Nord, has contributed an important work on "Studies on Cancers of the Eye"; Amodru, from Seine-et-Oise, was a medallist of the Paris hospitals, the distinction having been conferred in part because of the excellence of his thesis; a good half dozen or more are laureates of the academy; a number are officers and more are members of the academy; several bear the decoration of the Legion of Honor.

One of the most interesting facts, however, that is brought to the surface by a study of the bibliography of the medical deputies of France strikingly confirms the position assumed by me at Kansas City last January, and on a number of other public occasions, as well as in this correspondence, to the effect that the education, occupation and general view-point of the physician, enable him to approach sociological questions with a clearness of understanding not enjoyed by other members of society. The confirmation of this view is found in the fact that French physicians, notably those in the Senate and Chamber of Deputies, are careful students and writers on this class of subjects. Thus, Vogeli, from Isère, is one of the best known writers of this class, his contributions having appeared for the most part through the columns of the *Reveil du Dauphiné*, of which he was for years the director; he has translated important works from both the English and Portuguese languages, among others those of Agassiz, and as he has had the distinction of serving his country for fourteen years on foreign missions. Vazeille, from Loiret, is extensively known because of his work entitled, "La question Sociale est une question de methode." Baudon, from Oise, has issued a critical work on the relations of church and state that has assumed decided importance in presence of the present crisis between the French government and the Vatican, a crisis which it tended more than a little to precipitate. De Lanessan, from Rhone, has written learnedly, not only on questions of natural science, but has studied and written on sociological and governmental questions connected with the colonial interests of France; particularly on those connected with Indo-China. Dubief, from Saône-et-Loire, has not only been for many years a general councilor and vice-president of the general council, but has been at different times director of two great asylums for the insane, that of the Rhone, and that of St. Pierre at Marseilles, and has also written on social and political themes, having been at one time the editor-in-chief of the important periodical known as the "Union Republicaine de Saône-et-Loire." Dubois, of the Paris delegation, is one of the trenchant writers on social questions in the *Petite Republique*, and is an officer of the academy. Meslier, also of the Paris delegation, is likewise one of the best-known authors of sociological studies. Delbet, of the department of Seine-et-Marne, is so highly esteemed as a student of sociological questions that he was sent by the Societé d'Economié Sociale as a special envoy to Syria, Asia Minor, Egypt, and the further Orient, his reports being to-day accepted as standard contributions to the literature of sociology..

One of the most gratifying features revealed by an examination of the personnel of the Chamber of Deputies is the fact that, although that body, like our House of Representatives, ranks as the lower branch of the national legislature, it embraces among its members many who have held higher rank in the political scale. This is observable among the medical as well as the lay members. The two most conspicuous examples that have been brought to my attention among the medical members are those of de Lanessan, of the department of the Rhone, and de Mahy, deputy for the colonies. The former graduated as a physician in 1872, subsequently served as governor-general of Indo-China, later as minister of marine in the cabinet of the late Waldeck-Rousseau, and now sits as the representative of a modest constituency of less than twelve thousand. The other, de Mahy, is probably a still more striking example; he was given his doctorate in medicine in 1871; served in the National Assembly; accepted the secretaryship of Agriculture consecutively in the cabinets of Freycinet, Duclerc, and Fallières, and was subsequently minister of marine in the cabinet of Tirard. Yet, after all these honors, he accepted election to the relatively modest office of deputy, serving

two terms as vice-president of the chamber. He has recently been returned by his constituency at Réunion without opposition. This spirit is certainly to be commended, and is one that may well be emulated in a democracy, which always has certain claims on the wisdom of those on whom it has bestowed its choicest honors. I do not know to what extent these examples may find parallels in our own country, but I at this minute recall that John Quincy Adams did not think it beneath his dignity to serve one or more terms in our National House of Representatives after he had retired from the office of President of the Republic. There can be no valid reason why presidents, members of the cabinet, or senators, after returning to the ranks of plain citizenship should cease to exercise all the rights and duties of citizenship. Nor is there any good reason why physicians, because they are physicians, should not do the same thing.

These are facts that the medical men of America ought to take home to themselves. The time, the eve of a general election, is auspicious for both thought and action. The special food for thought may be found in a brief résumé of the facts brought out in this correspondence:

1. In the French Senate there are thirty-nine medical members; in the United States Senate there are two.

2. In the French Chamber of Deputies—the popular branch of the government—there are fifty-one medical members; in the United States House of Representatives—the corresponding branch of our government—there is not a single medical member.

The duty of the American medical profession, to itself, to society, and to the country, is obvious.

CHARLES A. L. REED.

Queries and Minor Notes.

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish his name will be faithfully observed.

DIFFERENTIAL DIAGNOSIS OF PARATYPHOID FEVER.

RATHBURN, S. C., Sept. 21, 1904.

To the Editor:—Can you refer me to a good treatise on paratyphoid fever? Some time ago you commented editorially on its pathology, but I want its symptomatology as well.

THEO. A. QUATTLEBAUM, M.D.

ANSWER.—There is as yet no complete treatise on the subject of paratyphoid fever in English, the nearest approach being an article by Johnston in the *American Journal of Medical Sciences*, 1902, p. 187, in which four cases are reported and the literature to that date reviewed. See also P. Clemens' "Ueber den Paratyphus," *Deutsche med. Woch.*, 1904, pp. 280 and 314. The usual clinical examination does not serve to distinguish positively between typhoid fever and paratyphoid, but it is possible to obtain some suggestive evidence. Bleeding from the nose, a cutaneous eruption, diarrhea, enlarged spleen, intestinal hemorrhages and relapses occur in both diseases. It is stated that the eruption in paratyphoid is often hemorrhagic, and that the course of the disease is usually milder than in typhoid. It is possible that the enlargement of the spleen is not so conspicuous in paratyphoid; "the enlargement can often be made out by percussion, and in a few cases is said to be palpable." The temperature curve in general resembles that of typhoid, but is of a more irregular character, and the average and maximum temperatures are lower. The pulse is that of a mild typhoid. The disease lasts from 12 to 84 days, and convalescence is sometimes remarkably long. In the few cases which have gone to autopsy, the ulcerations of Peyer's patches, so characteristic of typhoid fever, have been lacking. Superficial erosions of the mucosa and enlargement of the lymphoid follicles, however, do occur. There are two important diagnostic points in the way of bacteriologic tests. Paratyphoid should give a Widal reaction which, if not absolutely negative, is so low that it makes the diagnosis of typhoid fever unlikely. It is, moreover, possible to differentiate positively by making cultures from the blood of the patient and identifying the organism bacteriologically. Certain cultural characteristics of the paratyphoid bacillus allow it to be differentiated from the bacillus of typhoid fever. Although the treatment of the two diseases is in no sense different, the above means of diagnosis should, for evident reasons, be utilized when circumstances permit.

TINCTURE OF IRONWOOD BARK FOR DIABETES.

NEW CASTLE, IND., Sept. 15, 1904.

To the Editor:—In THE JOURNAL, Sept. 10, page 768, in a résumé of an article from the *Brazil Medico*, Rio de Janeiro, from the pen of Dr. Freitas, the tincture of *Dialium ferrum* is strongly recommended in the treatment of diabetes. I am anxious to learn more of this matter and desire that you advise me as to Dr. Freitas' address, or as to how I may inform myself in absence of the entire article as published in the Brazil periodical.

HENRY W. GREIST.

ANSWER.—We do not think the preparation can be procured in this country. The address of the writer was given in connection with the abstract on page 766: Dr. Octavio de Freitas, Pernambuco, Brazil. His communication was presented to the Pernambuco Sociedade de Medicina, July 1, 1904. The tree to which he refers is called *pao ferro* or *quiripinanga* in portuguese. It belongs to the *Cesalpinieæ*, and is a pod-bearing tree of the same family which includes the tamarind. It is noted for its hard and beautiful wood. It grows in inland tropical or semitropical regions. He gives the botanical name as the *Dialium ferrum*, *Dialium divaricatum* (Nahl), and *Arurusa guianensis* (Aublet), but the botany lists these as separate trees. The *Dialium arouna* or *Codarium guianense* is the velvet tamarind of Sierra Leone. The botany further states that the general character of this subgroup of the leguminous trees is their purgative properties. The tamarind is used in the confection and the infusion of senna, but some of the pods are edible, as that of the tamarind plum. As stated in the abstract, de Freitas used an alcoholic extract of the inner bark. The common name in Brazil is evidently *pao ferro*, which is, literally, iron wood.

MELANCHOLIA DURING PREGNANCY AND THE PUERPERIUM.

M. A. H., of Cowards, S. C., sends us an account of a case of melancholia during the puerperium and asks advice. The patient is a ill-para; the melancholia began during pregnancy and persists four months after the birth of the child. The patient is indifferent to the child, talks very little, avoids all company, has a poor and variable appetite and has disturbed sleep. The treatment instituted, comprising good nursing, bathing, nourishing food and the administration of iron, arsenic, strychnin and cascara, is very proper. We would suggest further that the child be removed from the mother, both because she would better not try to nurse it and because there is danger that she might injure it. A total change of scene, if possible, should be recommended. Sometimes travel is beneficial if the circumstances of the patient permit. An ideal place for such a patient is a quiet home in the country where there are no children or other disturbing elements, where there is sufficient diversion and where she can have the care of an intelligent, cheerful and sympathetic companion. Considerable time and patience may be required to effect a cure. The mistake should not be made of allowing a premature return to old associations. If the importance of the case is appreciated and all circumstances and possibilities carefully considered, it will generally be found possible, even with a patient in very limited circumstances, to arrange for such a change of scene.

Marriages.

WILLIAM C. SPANGENBURG, M.D., to Miss Clara Adams, both of Chicago, September 15.

DAVID J. MATTHEWS, M.D., to Miss Louanna Hahn, both of Zanesville, Ohio, September 14.

BURCHARD H. ROARK, M.D., Milwaukee, Wis., to Miss Mabel Florence Bryce, of Indianapolis, Ind., September 21.

CHARLES WHITTIER YOUNG, M.D., Chicago, to Miss Olive Doyle, at Baltimore, September 15.

AUGUSTUS POHLMAN, M.D., Baltimore, to Miss Kathleen Black, at Cincinnati, September 13.

IRA ENGLAR WHITEHILL, M.D., to Miss Sara Maynard Smith, at New Windsor, Md., September 14.

DENNIS FRANCIS FITZPATRICK, M.D., to Miss Marie Pauline Murphy, both of Iowa City, September 28.

JOHN FRANKLIN SNYDER, M.D., Monroe Center, Ill., to Miss Vernie Blanche Sheaff of Holcomb, Ill., September 21.

WILLIAM WAYLAND FRAMES, M.D., Baltimore, to Miss Jennie Louisa Whitbread, at Syracuse, N. Y., September 14.

JOHN IRVING MCKELWAY, M.D., King's Park, Long Island, N. Y., to Miss Mabel Sanger Bennett of Binghamton, N. Y., September 17.

Deaths.

James G. Lyndman, M.D. Medical College of Ohio, Cincinnati, 1874, a member of the American Medical Association; for seventeen years secretary of the Medical College of Ohio, and professor of chemistry and laryngology in the institution;

a member of the Ohio State Medical Association and the Academy of Medicine of Cincinnati, one of the most prominent physicians of Cincinnati, died at the Good Samaritan Hospital in that city, September 18, three days after an operation for appendicitis, aged 51. The faculty of the college, at a special meeting, September 20, passed resolutions eulogistic of their departed colleague and beloved friend.

Charles E. Pease, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1882, of Middletown, Pa., surgeon for the Pennsylvania System and the American Tube and Iron Company, died at the German Hospital, Philadelphia, September 12, from catarrh of the stomach, after an illness of several months and an operation for appendicitis, aged 47.

John A. Wegg, M.D. Western Reserve University Medical Department, Cleveland, Ohio, 1865, a member of the American Medical Association, formerly a leading physician of Sandusky County, Ohio, residing at Rollersville, but who had lived in Cobreville, San Jago de la Vega, Jamaica, British West Indies, died recently at his home in Jamaica.

Francis P. Phelps, M.D. University of Maryland School of Medicine, 1853; surgeon of First Eastern Shore Volunteers from 1861 to 1863; a member of the House of Delegates of Maryland from 1893 to 1895, and a justice of the peace since 1900, died suddenly from acute gastritis at his home in Cambridge, Md., September 17, aged 74.

Henry Ridgeley, M.D. Medical Department of the University of Pennsylvania, Philadelphia, 1839, and president of the Farmer's Bank of the state of Delaware, died at his home in Dover, Del., September 17, aged 87. His death occurred suddenly and indirectly was due to hiccough, which began several days before.

George P. P. David, M.D. Kentucky School of Medicine, Louisville, 1891, for five years director of a large hospital in San Pedro Sula, Spanish Honduras, died at his home in New Orleans, September 18, suddenly from heart disease, aged 45.

Jacob Chambers, M.D. University of Buffalo, 1875, one of the managers, and surgeon of the City of Kingston Hospital, family physician to Judge Alton Parker, died at his home in Kingston, N. Y., September 16, aged 52.

George Jacob Hirth, M.D. University of Michigan, Department of Medicine and Surgery, 1891, of Milwaukee, died at a sanitarium in Wauwatosa, Wis., September 14, after an illness of a year, from paralysis, aged 38.

Ellery G. Fuller, M.D. Starling Medical College, Columbus, Ohio, 1888, died from Bright's disease, September 5, at his home in Sterling Center, N. Y., after an illness of two weeks, aged 46.

Charles Conrad, M.D. Tulane University of Louisiana, New Orleans, 1897, committed suicide by shooting himself through the heart at his home in Cleveland, Ohio, September 19, aged 35.

James H. Benton, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1876, of Newbern, N. C., died at Black Mountain, N. C., September 14, aged 61.

William L. Whitted, M.D. Miami Medical College, Cincinnati, 1878, of Bloomington, Ind., died at Oceanside, Cal., where he had gone a year ago for his health, September 8.

E. Von Koehring, M.D. Friedrich Wilhelm University, Berlin, Germany, 1865, died at his home in San Antonio, Texas, September 14, from cerebral hemorrhage, aged 58.

Andrew D. Finucane, M.D. Bellevue Hospital Medical College, New York City, 1884, of Chicago, died at the Illinois Northern Hospital for the Insane, Elgin, August 16.

Frederick Dorsey Mitchell, M.D. University of Maryland School of Medicine, Baltimore, 1846, died at his home near Hereford, Md., September 15, aged 80.

Victor Rounds, M.D. Rush Medical College, Chicago, 1882, died recently at his home in Brainerd, Minn., and was buried at Verndale, Minn., September 20.

Allen M. Pierce, M.D. Rush Medical College, Chicago, 1861, an Army surgeon during the Civil War, died at his home in Wyoming, Ill., June 10.

William N. Ash, M.D. Toledo (Ohio) Medical College, 1883, died suddenly at his home in Mount Eaton, Ohio, September 14, aged 45.

G. C. Dortch, M.D., of Clarksville, Tenn., died at the home of his daughter in South Ryegate, Vt., September 10, from heart disease.

William H. Wheeler, M.D. Indiana, 1897, died at his home near Hartford City, Ind., September 14, after a short illness, aged 80.

Willard T. Parsons, M.D., died at the Spencer Hospital, Meadville, Pa., September 4, from an overdose of chloral, aged 49.

Henry F. Campbell, M.D., of Melrose, Mass., died suddenly in Boston, from heart disease, September 14, aged 65.

S. A. Meecham, M.D., died recently at his home in Norden, Neb., from malignant disease of the head, aged 87.

Charles Galloway, M.D. Rush Medical College, Chicago, 1892, died at his home in Libertyville, Ill., September 15.

Julian Fajans, M.D. Jefferson Medical College, Philadelphia, 1886, died at his home in Philadelphia, August 26.

Samuel S. Strayer, M.D. Chicago Medical College, 1872, died at his home in Naperville, Ill., August 18.

William M. Henry, M.D. University of Louisville, 1885, died recently at his home in Onton, Ky., aged 66.

Frank M. Sisson, M.D. New York, 1881, died in Rochester, N. Y., August 23, aged 49.

D. M. Reagan, M.D., died at his home in Buda, Texas, from cancer, August 14, aged 72.

George Clough, M.D., died at his home in Kansas City, Mo., August 23, aged 83.

Deaths Abroad.

Niels R. Finsen, M.D., pioneer in scientific phototherapy, died, September 24, in Copenhagen, aged 43. He was a native of the Faroe Islands. He began his work while a student in the Copenhagen University, from which he was graduated in 1890. Three years later he published an article on "The Influence of Light on the Skin," which aroused general attention because of his assertion that smallpox could be cured by the red-light treatment. This was but one application of the Finsen theory that light rays contained healing powers, and to develop the positive element of his theory he began experimenting with concentrated artificial light rays. As a result of his experiments, he effected a cure for lupus vulgaris. This cure directed great attention to the young investigator, and in 1896 the Municipal Hospital of Copenhagen allowed Professor Finsen several small buildings on its grounds in which to carry on his experiments. The Danish government then became interested in the support of the institution, and this support enabled the institute to be removed to Rosenvaenget, a suburb of Copenhagen, where under the direction of Professor Finsen, with a staff of scientists of national repute, expert electricians, and trained nurses, many cures of cases previously deemed incurable were made. In December, 1903, Professor Finsen was awarded the Nobel prize. For several years he had suffered from dropsy resulting from heart disease, but so intense was his devotion to his work that he hardly spared time from his studies for sleeping and eating, much less to recuperate his health. His death is attributable to an aggravation of the diseases from which he had suffered during his entire adult life by reason of his persistent overwork.

H. Kobner, M.D., one of the founders of German dermatology and one of its most prominent representatives, died at Berlin, September 3, aged 66, just a few days before the dermatologists of the world were to gather at Berlin for the fifth international congress of dermatology. Köbner founded at Breslau in 1861 the first clinic for skin diseases and syphilis in Germany, and later became director of the clinic established by the university, but was soon compelled to resign on account of his health. He settled in Berlin in 1877, where his dermatologic policlinic and postgraduate courses were very popular. Among the subjects especially connected with his name are sycosis, mycosis tonsurans, leprosy, drug exanthemata, etc., his works on these and allied subjects having been numerous and important.

State Boards of Registration.

COMING EXAMINATION.

Board of Medical Examiners of the State of California, San Francisco, October 25. Secretary, Charles L. Tisdale, M.D., Alameda.

New Rules in Kentucky.—The State Board of Health of Kentucky, in putting into effect the new law requiring all applicants for license to pass an examination, has adopted rules

and procedures which we reproduce from a circular just issued by the board.

REQUIREMENTS FOR MEDICAL COLLEGES AND STUDENTS.

On and after July 1, 1905, every medical college shall comply with the following requirements as a condition of being recognized as reputable by the State Board of Health of Kentucky:

1. It shall uniformly exact the requirements for matriculation set forth in "requirements for admission to medical colleges," adopted by this board.

2. It shall literally observe its own published requirements for admission, tuition, time of attendance at the annual sessions and graduation, which must be definitely expressed.

3. It shall have adequate equipment and an active and competent faculty for teaching the science and art of medicine, embracing the following departments, viz.: Anatomy, physiology, chemistry, pathology, histology, bacteriology, surgery, obstetrics, gynecology, ophthalmology, otology, hygiene and state medicine, medical jurisprudence, physical diagnosis and therapeutics and practice in accordance with the system to which the college belongs.

4. It shall have clinical and hospital facilities based on a minimum municipal population at its place of location of not less than 50,000; provided, that this requirement shall not apply to institutions under state control which, by virtue of such control, receive patients gratuitously from all parts of such state.

5. It shall require actual attendance on 80 per cent. of each of four courses of instruction of not less than thirty continuous weeks, excluding holidays, in four separate years, and shall not hold more than one graduating course in any one year. (It should be noted that no provision is made for giving advanced standing for A.B., B.S., or other degrees.)

6. It shall not accept notes in payment of fees, or offer or accept scholarships, or any reduction in fees, or any form of rebates, except as provided for or required under state laws or under the laws of endowed universities, and no student shall be given credit for attendance, or advanced, or graduated, until all fees have been paid.

7. Colleges may honor official credentials issued by medical colleges of equal requirements, as to students who have complied with the "Requirements for Admissions to Medical Colleges," except in the branches of study embraced in the last year of their own curriculum.

REQUIREMENTS FOR ADMISSION TO MEDICAL COLLEGES.

All colleges shall require every medical student applying for matriculation on and after July 1, 1905, to present to it "A Medical Student's Certificate," issued to him by a certified examiner of the state board of health or state board of medical examiners of the state in which such college is located, approved by such board, and a certificate of good moral character.

The examiner shall require as a basis for his certificate:

(a) A degree of A.B., B.S., or equivalent, from an approved university, college or academy of arts, science or philosophy.

(b) A diploma or certificate of graduation from an approved high school or normal school.

(c) A state teacher's permanent or life certificate.

(d) A medical student's certificate from any state board of health or examiners demanding equal requirements.

Or, an examination in writing in the following branches:

(a) English, submitting a composition in his own handwriting on some subject of general interest embracing not less than two hundred words, which shall be considered with reference to penmanship, spelling, pronunciation, thought and construction.

(b) United States history.

(c) Arithmetic, vulgar and decimal fractions, percentage and compound numbers.

(d) Algebra, through equations.

(e) Latin, through first year of ordinary course.

(f) Physics, the elements of mechanics, hydrostatics, hydraulics, heat, optics and acoustics.

GRANTING OF CONDITIONS.

Applicants failing to obtain a general average of 75 per cent. in the entrance examination and failing below 55 per cent. in but two branches may be conditioned by the official examiner, on a different form of certificate. The examiner shall make a separate list of such conditioned applicants in duplicate, one copy of which shall be sent to the state board of health or examiners and the other retained in his office.

REMOVAL OF CONDITIONS.

Such conditions must be removed by the presentation of a certificate from the examiner that such applicant has passed a satisfactory examination in the branches in which he was formerly found deficient, before he can receive credit for the first or be permitted to enter on his second year of study, and the examiner shall furnish a list of such applicants to the state board of the jurisdiction.

FEE.

Two dollars is hereby fixed as the fee to be collected by the examiner for each certificate in Kentucky. Those examined in special subjects to remove conditions will not be required to pay again, but those failing and taking a second examination will pay another fee.

Kentucky Examination Announcement.—The first semi-annual examination by the State Board of Health of Kentucky, under the new medical law, which became operative June 13, 1904, will be held at the School Board Building, corner Center and Walnut streets, Louisville, beginning at 10 a. m., on Monday, Oct. 3, 1904, and continuing for three days. All applications should be sent to the board at Bowling Green at least five days prior to the date fixed for the examinations, and applicants should be present by 9 a. m. of the first day. No one can be examined who is not reputable in the school or system of practice to which he professes to belong, and who does not hold a diploma issued to him by a college located within the United States, recognized as being reputable by this board. Each applicant must present to the secretary, at the examination, a recent photograph of himself, the reverse side of which shall contain his signature, written in the presence of the secretary, and he shall make oath before such officer that it is his true picture and signature, and that he is the legal holder of the diploma under which the application is made. The filing of an application, or taking an examination, does not authorize the applicant to practice, and no one can legally engage in practice until he has obtained his certificate and registered in the county of his residence. Non-residents and holders of foreign diplomas are not eligible for examination. The fee of ten dollars should be sent to the secretary, Dr. J. N. McCormack, Bowling Green, Ky., with the application.

The Public Service.

Army Changes.

Memorandum of changes of station and duties of medical officers, U. S. Army, week ending Sept. 24, 1904:

Devereux, J. R., asst.-surgeon, left Fort Meade, S. D., with Sixth Cavalry on road march.

Smart, Charles, asst.-surgeon general, Smart, Robert, and Metcalfe, R. F., asst.-surgeons, arrived at San Francisco on the *Sherman* from Manila, P. I.

Church, James R., asst.-surgeon, relieved from duty at Fort Brown, Texas, on expiration of sick leave and ordered to Fort Robinson, Neb.

Stark, Alexander N., asst.-surgeon, reports on three months' sick leave from date.

Greenleaf, Henry S., reports on ten days' leave from date on completion of duty at maneuvers.

Appel, D. M., deputy surgeon general, leave of absence extended to include Oct. 30, 1904.

McAndrew, P. H., asst.-surgeon, left Jefferson Barracks, Mo., with recruits for San Francisco.

Kean, Jefferson R., and Rafferty, Ogden, surgeons, detailed to represent Medical Department of the Army at the Thirteenth Annual Meeting of the Association of Military Surgeons of the United States, to be held at St. Louis, Oct. 10-15, 1904.

Stephenson, Wm., surgeon, granted thirty days' leave, permission to apply for twenty days' extension.

Smart, Charles, asst.-surgeon general, ordered to proceed from San Francisco to Army and Navy General Hospital, Hot Springs, Ark., for treatment.

Williamson, L. P., asst.-surgeon, relieved from further duty as medical director, Louisiana Purchase Exposition, St. Louis, and in addition to his duties as attending surgeon, headquarters Northern Division, he will perform the duties of examiner of recruits, St. Louis.

Buck, Carroll D., asst.-surgeon, in addition to his present duties, will perform temporarily the duties of medical director, Philippine Government Board, Louisiana Purchase Exposition, St. Louis.

Owen, Wm. O., surgeon, discharged from observation and treatment at U. S. Army General Hospital, Presidio of San Francisco.

Owen, Wm. O., surgeon, relieved from duty in Philippines, and to proceed from San Francisco to Fort Logan, Colo., for duty.

Steer, Samuel L., asst.-surgeon, granted thirty days' leave of absence.

Lyster, Wm. J. L., asst.-surgeon, leave of absence extended thirty days.

Greenleaf, H. S., asst.-surgeon, granted thirty days' leave of absence with permission to apply for thirty days' extension.

Brooks, John D., contract surgeon, ordered to temporary duty at Fort Washakie, Wyo., not later than September 13.

McMillan, Clemens W., contract surgeon, ordered from Fort Niagara, N. Y., to temporary duty at Fort Hamilton, N. Y.

Boak, B. Davis, Lauderdale, Clarence E., Mason, George L., and Wing, Franklin F., contract dental surgeons, arrived at San Francisco September 16 on the transport *Sherman*. They have completed three years' duty in the Philippines, and have been assigned to stations as follows: Dr. Boak to Fort Hancock, N. J.; Dr. Lauderdale to Fort Sam Houston, Texas; Dr. Mason to Fort McPherson, Ga., and Dr. Wing to Fort Riley, Kan.

Navy Changes.

Changes in the medical corps, U. S. Navy, for the week ending Sept. 24, 1904:

Curl, H. C., P. A. surgeon, detached from the *Boston* and ordered to duty in connection with the Isthmian Canal Commission.

McDonell, W. N., A. A. surgeon, detached from the Naval Recruiting Station, Baltimore, Md., and ordered home to wait orders.

Rodman, S. S., P. A. surgeon, detached from the *Pensacola* and ordered to the *Boston*.

Wilson, H. D., P. A. surgeon, ordered to additional duty on the *Southery*, September 28.

The following named asst.-surgeons are detached from the stations indicated and ordered to the Naval Museum of Hygiene and Medical School, Washington, D. C., September 30: R. G. Heiner, *Southery*; R. B. Chapman, Navy Yard Washington D. C.; R. E. Stoops, Naval Hospital, Norfolk, Va.; F. E. Porter, Naval Hospital, Norfolk, Va.; H. F. Hull, Naval Hospital, Newport, R. I.; W. D. Owens, Naval Hospital, Newport, R. I.; J. L. Belknap, Naval Hospital, N. Y.; D. C. Cather, Naval Hospital, New York; N. T. McLean, Naval Hospital, New York; G. L. Wickes, Naval Hospital, Philadelphia; W. J. Zalesky, Naval Hospital, Philadelphia; O. J. Mink, Naval Hospital, Philadelphia; H. A. May, U. S. R. S. *Franklin*; C. T. Grayson, Naval Hospital, Washington, D. C.; W. A. Angwin, Naval Hospital, Mare Island, Cal.; W. G. Farwell, Recruiting duty, Portland and Bangor, Maine.

Braisted, W. C., surgeon, detached from the *Pensacola* and ordered to the *Ohio*.

McCullough, F. E., surgeon, ordered to the *Pensacola* and to duty at the Naval Training Station, San Francisco.

Kennedy, R. M., surgeon, detached from the *Dixie* and ordered to the *Missouri*.

Lovering, P. A., surgeon, ordered to the Naval Museum of Hygiene and Medical School, Washington, D. C., October 3.

Perebee, N. McP., medical director, sick leave extended three months from September 20.

Marine-Hospital Service.

List of changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine Hospital Service for the seven days ended Sept. 21, 1904:

Gassaway, J. M., surgeon, detailed to represent the Service at the meeting of the Association of Military Surgeons at St. Louis October 10-15.

Carmichael, D. A., surgeon, granted leave of absence for one month from October 18.

White, J. H., surgeon, granted leave of absence for six days from September 19.

McIntosh, W. P., surgeon, to proceed to Stonington, Maine, for special temporary duty.

Woodward, R. M., surgeon, Department letter of May 13, 1904, granting leave of absence for three months amended to read two months and twenty-six days from June 14.

Stoner, J. B., surgeon, to proceed to Cape Charles Quarantine Station and assume temporary charge during the absence of Asst.-surgeon J. S. Boggess; granted leave of absence for eight days from September 28.

Wertenbaker, C. P., surgeon, on being relieved from duty at New Orleans, La., by P. A. Surgeon A. C. Smith, to proceed to the Immigration Depot, Ellis Island, N. Y., and report to Surgeon G. W. Stoner for duty.

Smith, A. C., P. A. surgeon, on being relieved from duty at New York (Stapleton) by P. A. Surgeon J. A. Nydegger, to proceed to New Orleans, La., and assume command of the Service, relieving Surgeon C. P. Wertenbaker.

Nydegger, J. A., P. A. surgeon, relieved from duty at the Immigration Depot, Ellis Island, N. Y., effective Oct. 1, 1904, and directed to proceed to New York (Stapleton) and report to the medical officer in command for duty and assignment to quarters, relieving P. A. Surgeon A. C. Smith.

Foster, M. H., P. A. surgeon, granted extension of leave of absence on account of sickness for thirty days from September 18.

McLaughlin, A. J., asst.-surgeon, granted leave of absence for twenty-four days from October 3.

Hamilton, H. J., A. A. surgeon, granted leave of absence for thirty days from October 1.

Richardson, S. W., pharmacist, relieved from special temporary duty in connection with the Louisiana Purchase Exposition at St. Louis, and from duty in the Hygienic Laboratory, Washington, D. C., and directed to proceed to Boston, Mass., and report to the medical officer in command for duty and assignment to quarters.

LaGrange, J. V., pharmacist, Department letter of Aug. 30, 1904, granting leave of absence for twenty-three days from September 15, revoked.

Keen, W. H., pharmacist, Bureau order of Aug. 26, 1904, directing him to proceed to Boston revoked, and directed to proceed to Chicago and report to the medical officer in command for duty and assignment to quarters.

REINSTATEMENT.

Bierman, C. H., New York, reinstated as pharmacist of the third class.

BOARD CONVENED.

Board convened to meet at Stapleton N. Y., Sept. 19, 1904, for the physical examination of an officer of the Revenue-Cutter Service. Detail for the board: P. A. Surgeon A. C. Smith, chairman; P. A. Surgeon C. H. Lavinder, recorder.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon General, Public Health and Marine-Hospital Service, during the week ended Sept. 23, 1904:

SMALLPOX—UNITED STATES.

Illinois: Chicago, Sept. 10-17, 14 cases, 2 deaths.
Louisiana: New Orleans, Sept. 10-17, 1 case (imported).
Massachusetts: Sept. 10-17, Lawrence, 1 case; North Adams, 9 cases.
Michigan: At 41 places, Sept. 3-10, present.
Minnesota: Morrison County, Sept. 6-13, 1 case.
Missouri: St. Louis, Sept. 10-17, 11 cases.
New York: New York City, Sept. 10-17, 2 cases.
Pennsylvania: Philadelphia, Sept. 10-17, 1 case, 1 death.
Rhode Island: Providence, Sept. 10-17, 1 case.
Tennessee: Sept. 10-17, Memphis, 1 case; Nashville, 2 cases.
Wisconsin: Milwaukee, Aug. 27-Sept. 17, 6 cases.

SMALLPOX—FOREIGN.

Belgium: Antwerp, Aug. 27-Sept. 3, 1 case.
Borneo: Brunai, Aug. 8, epidemic.
Brazil: Pernambuco, Aug. 17-31, 28 deaths.
China: Hongkong, July 30-Aug. 6, 2 cases.
France: Paris, Aug. 27-Sept. 3, 29 cases, 1 death.
Great Britain: Bradford, July 31-Aug. 27, 9 cases; Aug. 27-Sept. 3, Bristol, 1 case; London, 2 cases; Manchester, 2 cases; Newcastle-on-Tyne, 3 cases; West Hurtlepool, 2 cases; Glasgow, Sept. 2-9, 2 cases, 1 death; Leeds, Sept. 3-10, 1 case.
India: Bombay, Aug. 16-23, 1 death.
Italy: Palermo, Aug. 27-Sept. 3, 9 cases, 2 deaths.
Russia: Moscow, Aug. 16-23, 7 cases, 2 deaths; Odessa, Aug. 28-Sept. 3, 7 cases; St. Petersburg, Aug. 20-27, 2 cases, 4 deaths.
Turkey: Beirut, Aug. 20-Sept. 3, present; Constantinople, Aug. 28-Sept. 4, 6 deaths.

YELLOW FEVER.

Mexico: Coatzacoalcos, Sept. 3-10, 7 cases, 2 deaths; Sept. 4-10, Merida, 1 case; Tehuantepec, 1 death; Vera Cruz, Aug. 27-Sept. 10, 16 cases.
Panama: Panama, Sept. 5-12, 1 case, 1 death.

CHOLERA.

Borneo: Kudat, Aug. 19, present.
India: Bombay, Aug. 16-23, 12 deaths.
Turkey: Bagdad vicinity, July 23-Aug. 6, 844 cases, 1,023 deaths.

PLAGUE.

China: Hongkong, July 31-Aug. 6, 13 cases, 12 deaths.
Egypt: Aug. 13-20, 10 cases, 7 deaths.
India: Bombay, Aug. 16-23, 50 deaths; Karachi, Aug. 14-21, 4 cases, 2 deaths.
Japan: Formosa July 23-Aug. 6, 21 cases, 27 deaths.
Turkey: Smyrna, Sept. 8, present.

Society Proceedings.

COMING MEETINGS.

AMERICAN MEDICAL ASSOCIATION, Portland, Ore., July 11-14, 1905.

Colorado State Medical Society, Denver, October 4-6.
Idaho State Medical Society, Lewiston, October, 6-7.
Tri-State Medical Society of Alabama, Georgia and Tennessee, Chattanooga, October 12-14.
Assn. of Military Surgeons of the U. S., St. Louis, October 10-15.
Mississippi Valley Medical Association, Cincinnati, October 11-13.
Vermont State Medical Society, Rutland, October 13-14.
New York State Medical Association, New York, October 17-20.
Medical Society of Virginia, Richmond, October 18-21.
American Confederation of Reciprocating Examining and Licensing Medical Boards, St. Louis, October 25, 1904.

AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Seventeenth Annual Meeting, held at St. Louis, Sept. 13-16, 1904.

(*Continued from page 907.*)

Operative Treatment for Painful Menstruation in Young Virgins.

DR. WILLIAM A. B. SELLMAN, Baltimore, pointed out the great necessity of giving relief to young unmarried women who suffered from painful menstruation. The forms of dysmenorrhea that could be relieved by operative means were expatiated on at length. These means should not be of a character to unsex the patient nor prevent her from bearing children or from fulfilling her marital relations. The operation should not be one which will endanger life or interfere with the woman's general good health. To illustrate the condition and to demonstrate the manner in which cases could be operated on without unsexing the individual and giving absolute relief from the suffering experienced, he related the following case on which he operated in the early part of June, 1904: Miss H., aged 24, a brilliant vocalist, with a register of three octaves, had been unable to use her voice with any satisfaction for a long period on account of the pain developed in the ovarian region when attacking the high notes. June 7, 1904, under ether anesthesia, the endometrium was curetted and a quantity of congested tissue removed from the cavity of the uterus. He then made an abdominal incision in the median line, and found both ovaries hyperemic and distended. Upon the left side he opened three good-sized cysts and on the right side two medium-sized cysts. He enucleated these with a sharp spoon curette and scraped the walls in order to destroy the membrane. He closed the openings with catgut sutures and used the same material to close the opening in the abdominal wall. The patient made an uninterrupted and rapid convalescence, and had not had the slightest amount of pain in the ovarian region, and no pain during two menstruations which she had passed through since the operation. He thought very many gynecologic surgeons would have removed both ovaries under these conditions, and the result would have been the unsexing of the patient and probably the loss of her voice, especially in the upper register. He had heard her sing, and was certain that her voice had not been impaired. Two physicians present during the operation expressed the opinion that no relief would follow the operation unless he removed the appendages. Resection of the ovary was followed by such successful results that one was not justified in removing the organs unless the complications present gave no opportunity to perform the conservative opera-

tion. Lastly, he spoke of that class of cases in which dysmenorrhea was due to a general systemic neuralgic condition. In these cases one at times afforded great relief by the use of the various forms of electricity. It was doubtful in many of the cases whether removal of the appendages would accomplish anything more than to bring amout a premature menopause, and the patient would remain just as nervous as before operation.

DISCUSSION.

Dr. H. W. Longyear, Detroit, Mich., stated that in operating, if one could save an ovary or part of an ovary, he should do so. In the majority of cases, one could conserve tissues there with perfect safety and with the result of allowing the woman to menstruate as she would in a normal condition. He would enter a protest against operating on cases of dysmenorrhea that were of short duration in young persons. One should not suject any unmarried woman to an operation if it could be avoided. The minor cases of pain of short duration did not need operative measures.

Dr. Herman E. Hayd, Buffalo, N. Y., alluded to the importance of examination in these cases, and even after an examination was made one might find that the most distressing cases were the ones that practically had no evident pathology, which could be made out by such an examination. If on examination one should find a retroverted uterus, a prolapsed ovary, a tender sensitive tube, then there was a rational basis on which to work, but simply because a woman had a small os it did not follow that she was going to be the subject of dysmenorrhea, because in all probability most of these cases were simply due to an impoverished condition of the whole system. They were simply functional troubles, and had to be met accordingly. If, however, there was an obstructive dysmenorrhea, and usually these cases were associated with an atrophic condition of the uterus, probably one could institute some operative measures, and the interference which had been most successful in his hands had been dilatation and the wearing of a stem pessary.

Dr. William H. Humiston, Cleveland, Ohio, stated that dysmenorrhea was a common disturbance, and yet he had not been able to find a case that was not accompanied by an inflammatory condition of the mucosa. He had seen cases of narrow, conical os, with the patients menstruating without the least sign of distress, but the moment there was an inflammatory condition of the mucosa added, that moment the patients began to have painful menstruation. In cases of this kind he thoroughly dilated the uterine cavity, curetted, and had the patients wear an Etheridge pessary, closely watching them for several months, and if there was no accompanying disease of the appendages, the cure was decided and complete. In these cases occasionally one would have a failure because of not recognizing an ovary which was smaller than normal, the cirrhotic ovary, which was hard to detect unless an examination was conducted under an anesthetic, and there was no relief afforded except by the removal of these shrivelled, corrugated, smaller than normal ovaries.

Dr. D. Tod Gilliam, Columbus, Ohio, spoke of the undeveloped condition of the uterus as a cause of dysmenorrhea. A great many men had come to the conclusion that it was not a superficial condition; it was not produced by the condition of the mucosa, as a rule; nor the result of stenosis of the internal os or of many of the other orifices of exit, but was due to the undeveloped, unripe condition of the uterine tissues. The uterine tissues were just like unripe fruit, and one of the functions of the uterus was to throw off this membrane at stated intervals, and in doing so there were certain physiologic processes that must work their way or be concerned therewith. The time for the casting off of this membrane was at the menstrual period, a time when this membrane would easily come away, but which could not be removed at any other time without more or less violence. Vessels permeated this dense structure; these vessels were undeveloped; they were unable to accommodate the amount of blood sent there during the menstrual molimen, and this induced distress. The membrane closely adhering to the uterine wall was not ready to be exfoliated, hence it was a source of distress.

Dr. John Young Brown, St. Louis, Mo., said that his experience in dealing with cases of painful menstruation was that unless there was a palpable pathologic condition present, it was better to leave them alone. In looking up the etiology of pelvic disease, he had found in a rather extensive operative experience that the majority of cases that came to operation were of gonorrheal or puerperal infection, and those cases that came as the result of infection following minor office gynecologic procedures. He did not feel that a young woman who suffered from painful menstruation should be subjected indiscriminately to operative treatment or even to a gynecologic examination.

Dr. L. H. Dunning, Indianapolis, said that one ought not to approach any case of dysmenorrhea without studying the surroundings very carefully. He should have a complete and thorough history of the case in order to be able to determine the character of the lesion which was present before undertaking the treatment of the case. He had been surprised in studying the collected histories of some two thousand cases to find that in about 15 per cent. of them there was dysmenorrhea at the beginning of menstruation. This, he thought, would go to disprove one statement made by the essayist, that nearly all of the cases were due to inflammation, or that most of them were due to gonorrheal infection or some other kindred infection. In the majority of cases in which dysmenorrhea began with menstruation, he thought one would find some errors in the development of the organ or errors in the development of the nervous system which would lead to painful menstruation. Every case should be studied carefully on its merits. Some would be found to be due to nervous conditions, others to hyperemia of the ovaries, and still others to venous congestion of the pelvic organs, including the uterus and ovaries. Obviously, all of these were not cases demanding operative procedures.

Dr. Sellman stated that the object of his paper was to prevent, if possible, this suffering to women which came on about thirteen times a year. He thought that if any member of the Association had to undergo or endure the pain from which some of these patients suffered, even for only six times a year, he would seek some means of relief. He did not use instruments in all cases, but only in those cases where a gristly condition existed.

Pseudo-Membranous Monocystic Tubercular Peritonitis.

Dr. H. W. Longyear, Detroit, said that pseudo-membranous monocystic tubercular peritonitis was that form of tubercular peritonitis which was characterized by the formation of a thick, white, fibrinous, pseudo-membrane on all of the tubercular peritoneum, covering the parietal peritoneum and cementing together and covering the intestinal coils in such a manner as to form a sac of greater or less capacity, according to the progress of the disease, which contained straw-colored fluid, with occasionally jelly-like masses and shreds floating therein. He reported three cases of this affection, and stated that the treatment consisted of abdominal section, with evacuation of fluid and the thorough washing out of all shreds and gelatinous masses, with normal salt solution; thorough drainage by glass or rubber tubes, both abdominal and vaginal. This was to be followed by after-treatment, consisting of frequent lavage, with a weak aqueous solution of iodin (tincture iodin, 1 dram; water, 1 pint), until the pseudo-membrane was disintegrated and the purulent discharge that followed had ceased. Internally, the rational treatment of tuberculosis, consisting of the use of creosote, cod-liver oil, etc., a supporting diet, and suitable hygienic surroundings. The prognosis was bad, although a few cases might recover, if not too far advanced, after months of constant drainage and careful nursing.

DISCUSSION.

Dr. Rufus B. Hall, Cincinnati, said he differed from some writers in regard to the different varieties of tubercular peritonitis. He was of the opinion that it was tubercular peritonitis in different stages of development. In dealing with the operative treatment of tubercular peritonitis, ultimate success

depended largely on the variety of the disease, the general condition of the patient, the previous history, the great prostration, etc. Very many were in such a condition that they could not withstand much trauma of any kind. The greatest relief was to be afforded to those cases in which there was an accumulation of cysts by letting out the fluid and draining. He had time and again made section when the patients were in a desperate condition, put in a drain, and in six months or a year later the patients returned, when he removed one or two infected tubes, and cured them, whereas if he had done a prolonged operation at the outset, with the patients in a feeble condition, and unable to withstand trauma, they would not have rallied.

DR. L. H. DUNNING said there were two or three questions which ought to be settled in regard to the treatment of cases of encysted tuberculosis of the peritoneum. First, as to whether one ought to remove the fallopian tubes in all instances. He believed we should. He believed that all cases of encysted dropsy, where the fluid accumulated in the pelvis, as described by Dr. Longyear, were dependent on infection of the tube, and it ought to be removed or a fistula would persist indefinitely. Another question was with reference to drainage. He was in accord with both Dr. Longyear and Dr. Hall that these cases ought to be drained through the abdominal wall. They need not be drained through the vagina if one could possibly drain them in the other direction. Should one in these cases attempt to break up the adhesions? Dr. Price had insisted on breaking up adhesions in all cases of tuberculosis of the intestines, but he believed that this pseudo-membrane, which was an adventitious membrane thrown out, was protective, was conservative, on the part of nature, and that one ought not to attempt to separate adhesions. Another point was whether we were justified in attempting to shorten convalescence in these cases by curettement. In three of his own cases he had curetted sinuses and packed with gauze to the bottom of the cavity, and had had three recoveries. In one instance there was a wide invasion in the abdominal wall and pelvis, and with a great deal of timidity he used the curette, but did it carefully, and packed. This was followed by healing of the fistula within a short time.

DR. HERMAN E. HAYD, Buffalo, N. Y., said that usually those cases with simple effusion, or dropsy which was circumscribed, got well if opened, and the opening immediately closed. One did not need to disengage bowel nor disturb the adventitious membrane. Simply the entrance of air was an important factor in the cure of these cases. If there was pathology such as had been pointed out by the essayist, it was necessary to drain. However, he did not agree with Dr. Hall that all cases of tubercular peritonitis should be drained, as his own experience did not bear that out.

DR. J. HENRY CARSTENS, Detroit, thought that all that was necessary in ordinary, simple, encysted cases of this condition was to wash them out and let them alone. One should not try to break up adhesions, as serious complications might follow. In tubercular peritonitis the patients should be let alone as much as possible, and Nature given a chance. He said if he operated on a case of tubercular appendicitis and drained it, he would get trouble, because along the track of his drainage tube there would be tubercular deposits, and he would have a fistula there for a long time. On the other hand, if he took out the appendix, closed up the opening with silkworm-gut sutures *en masse*, tightly, he would have union without the formation of a fistula.

DR. D. TOD GILLIAM did not believe in too much interference in cases of tubercular peritonitis, or in such cases as had been described. He thought many of these patients would be better without operation if their cases were diagnosed accurately beforehand. In some cases of encysted tuberculosis he did not care whether the contents were merely washed out or not; by one method or another, one was likely to have bad results. There were other forms of encysted tuberculosis, however, in which one did not have these bad results, and in such cases it was necessary to open up the cysts. He did not believe in breaking up adhesions and separating viscera.

DR. LONGYEAR did not believe that a case of simple tubercular peritonitis, with a large cyst, and the abdomen full of dropsical fluid, needed to be drained, but agreed with Dr. Hayd that all that was necessary to do was to open it, wash out the cavity, sew up the wound, and the patient would get well. Many of them, however, would have a reformation of the fluid.

Chronic Adhesive Peritoneal Sclerosis.

DR. N. STONE SCOTT, Cleveland, Ohio, stated that among the rarer abnormal conditions found within the abdomen, was one peculiar, interesting, and possibliy more frequent than had heretofore been suspected. This condition was progressive, yet was characterized by an absence of active symptoms, including ascites. In the early stages the peritoneum was rigid and contracted; later the connective tissue became excessively hypertrophied, with adhesions between the involved peritoneum and all viscera with which it came in contact. As soon as these adhesions interfered with the functions of any organ, symptoms referable to such interference supervened. When the involvement prevented some important organ from performing its necessary functions, death ensued.

In an illustrative case cited by him only a circumscribed portion of the peritoneum (the pelvis) was affected.

The Relative Value of the Means and Methods Employed in Accouchement Force.

DR. E. GUSTAV ZINKE, Cincinnati, Ohio, read a paper in which he drew the following conclusions: 1. The graduated steel or vulcanite dilators and the ordinary branched or bladed dilators were mainly employed for the purpose of dilating the cervix or os preparatory to digital, manual and bag dilatation. 2. The bag or hydrostatic dilators, of which the Champetier de Ribes balloon and its modifications were the most favored, should be employed only when time was not an important element in the case; when the cervix was thoroughly softened, partly or entirely effaced, and an easy introduction of the balloon possible. This was contraindicated in central placenta previa, and in eclampsia, mild or severe. If, in these cases, it was determined to empty the uterus, deep cervical incisions, vaginal or abdominal hysterectomy, promised the best results for mother and child. To prevent continuation of the cervical incision a suture might be placed in the upper angle of the wound. 3. The manual dilatation of Harris and the bimanual (digital) dilatation of Bonnaire and Edgar. A soft and partially obliterated cervix and dilatable os were absolute prerequisites for this variety of uterine dilatation. It was to be preferred when time constituted an important element. Under this method the life of the fetus was often lost and, unless great care was observed, sepsis, lacerations, hemorrhage, profound shock and sometimes even death of the mother might occur. 4. Deep cervical incisions and Duhrssen's vaginal hysterotomy were destined to play a permanent and important rôle in the management of forced labors in the future. Many of the cases now subjected to manual or balloon dilatation would be treated by cervical incisions. It was the method in the presence of sepsis of the vagina, because the operation was short in duration and could be performed under a continuous flow of an antiseptic solution. An intact cervix, whether hard, elongated or not, was always an indication for cervical incision. Vaginal hysterotomy was indicated principally when the cervix was the site of malignancy or extensive cicatrization. If there were a palpable difference between passage and passenger, the conservative cesarean section should be the choice of operation. 5. The indications for the conservative cesarean section had been well defined in previous papers and it was needless to repeat them. Cervical incisions and Duhrssen's operation would, however, take its place in many instances, notably in cases of marked prematurity. 6. The Bossi and similar metal dilators, if they were not entirely needless, were certainly very dangerous instruments. From what had been said it was safe to predict that rapid and complete metal dilatation would never become a popular method; that sooner or later it would receive universal condemnation and thus reach its final and well-deserved destination—the lumber room of obstetric instruments.

DISCUSSION.

DR. HENRY SCHWARZ, St. Louis, was glad to hear Dr. Zinke's experience in reference to Duhrssen's vaginal cesarean section, because personally he had had no experience with that method. He could conceive of exceptional cases of eclamptic convulsions or of placenta previa in which cesarean section might be justifiable in proper hands and under proper surroundings. As a rule, in eclamptic convulsions Duhrssen's method should be the one of choice, and there could be very few exceptions where conservative cesarean section was indicated. No one would maintain in a case in which the placenta was eccentric, marginal or low seated, with hemorrhage, that cesarean section should be resorted to. Whenever one made a diagnosis of central placenta previa, the cervix was so far dilated that no one would think of doing anything except to deliver the child through the natural way. He thought Bossi's dilator had a limited sphere of usefulness.

DR. JAMES F. W. ROSS, Toronto, Ontario, said he had done cesarean section three times, in each case with the recovery of the mother and the loss of the child. The question between cesarean section and the Porro operation had been pretty well settled and the conclusion reached that the Porro operation, when cesarean section failed, enabled one to control hemorrhage. The last Porro operation he did was in a case reported to the society where a woman delivered herself up through the vagina into the abdominal cavity, and the fetus and placenta were forced through an enormous rent in the posterior vaginal cul-de-sac. In this case he did a Porro operation to control hemorrhage. He had operated on two cases of rupture of the uterus, with recovery, after having performed the Porro operation, by gauze packing, and he thought this operation in these cases should not be adopted unless there was hemorrhage that could not be controlled.

DR. O. J. ELBRECHT, St. Louis, spoke of Duhrssen's incisions, saying that he had had three or four of these cases, in which he had resorted to Duhrssen's incisions, with good results.

DR. J. HENRY CARSTENS called attention to the point that many practitioners were too anxious to dilate the cervix in the class of cases under discussion. He had seen them use rubber dilators and dilators of all kinds in working around the uterus for two or three days at intervals, and then finally had to send for someone to help them out of difficulty. Such practitioners wanted to know whether they should do this or do that. In some cases, after he had been called in consultation, he had found that the women were not in labor at all. He thought many of the members of the society had had similar experiences. It was a mistake to suppose that because a woman had a little pain at the approach of labor that she was actualy in labor.

DR. EUGENE J. BROWN, Stanford, Ky., said in these days of aseptic surgery, with the results we are having with mechanical and manual dilatation, cesarean section would become more popular, and evidently in selected cases more lives to both mother and child would be saved than by other methods. He had the pleasure of witnessing the operation by Dr. Deaver, referred to in the paper. It was performed on February 23 of this year. The simplicity and ease of the operation impressed him very deeply. The mother and baby got along without any trouble.

DR. M. W. MEYER, Columbia, Mo., spoke of the use of the Bossi dilator. While he admitted there were many men who used this instrument, and recommended its use in cesarean section, those who were not radical in the matter had determined that it was not an instrument to be used in such cases. In fact, one had to go back to the old methods of delivery in cases of placenta previa, namely, to resort to the use of tampons. One could accomplish more with them than in any other way.

DR. ZINKE said that whatever he may have said or written in the past on this subject and presented to-day came from a motive simply to do good in the future, and to get rid of a certain method of practice in obstetrics, which had been the means of rendering families unhappy and because he honestly believed that there was great room for improvement in this practice in spite of all that had been said against it.

Vaginal Cesarean Section in Grave Cases of Puerperal Eclampsia.

DR. J. HENRY CARSTENS, Detroit, said that mild cases of puerperal convulsions ordinarily could be controlled by the treatment generally advocated for this class of cases, but that there was a serious, grave form of puerperal eclampsia where one convulsion followed another in quick succession, and the patient finally died in spite of ordinary, and sometimes even heroic treatment. This severe variety of eclampsia could generally be subdued by immediate delivery. This was accomplished generally by manual dilatation, the use of powerful steel instruments, like that of Bossi, but what was better still was the operation called the vaginal cesarean section, which enabled the obstetrician to deliver the woman in about five minutes with little or no danger. In conclusion he stated that: 1, in grave puerperal eclampsia, as a rule, prompt delivery will save the patients; 2, that manual effort with the fingers and the hand was too slow; 3, powerful steel dilators were not always at hand, and often caused serious injuries; 4, vaginal cesarean section enabled the obstetrician to quickly and safely deliver the woman.

An Unusual Case with Many of the Symptoms of Appendicitis.

DR. MAGNUS A. TATE, Cincinnati, narrated this case, which was of interest because: 1. It presented an unusual history. 2. The symptoms and history of the case following scarlatinal nephritis led him and others to suppose that probably they were dealing with a case having appendicitis as a complication. 3. The patient urinated regularly and at no time was there a dribbling of urine. 4. The presence of adhesions and the enlarged bladder, with its thick walls, had only problematical causes, not explained satisfactorily by the history of the case.

The patient, a boy aged 7, was attended by Dr. L. Linss of Cincinnati for an ordinary attack of scarlet fever from Feb. 25 to March 18, 1904. March 21 Dr. Linss was called to see the boy on account of a swelling of the feet and hands. On the morning of April 1 all edema had disappeared; urine highly colored, but normal in quantity, with no sugar, albumin or casts. That afternoon the patient had a chill, vomited, and was suffering with a pain in the abdomen. Temperature, 99.5; pulse, 90. April 5, the patient had two more attacks of vomiting. Pain in the abdomen was constant, and he had not slept for twenty-four hours; temperature, 102, and pulse, 130. Dr. William Johnson saw the case with Dr. Linss, and on examination of the abdomen they found an uneven swelling which extended to the umbilicus and over the right lumbar region. On palpation exquisite tenderness over the appendix was elicited. A diagnosis of appendicitis was made, but further consultation was asked for. The next day, April 6, Dr. Tate was called. When he saw the patient, six days after the initial vomiting spell and chill, the child had been crying and moaning day and night, and could not sleep; temperature, 102; pulse, 132, very irregular; abdomen swollen, especially on the right side, and such marked tenderness that the child screamed if the slightest pressure was made over the region of the appendix. Bowels constipated and the urine highly colored. The following day there was no improvement, the pulse even worse; temperature remained at 102. Before placing the child on the operating table a bed-pan was placed under him and he passed nearly a pint of urine. Chloroform was administered, and an incision was made on the right side two inches in length, over the most prominent portion of the swelling. It revealed a dark-colored sac and a number of adhesions. The incision was lengthened to three inches. Some adhesions were broken down with the finger, but a few of them were so firm that they had to be cut. The enlarged opening gave a field of about two inches to work in, and the sac in appearance was not unlike that of a gangrenous bowel. They were at a loss to say exactly what it was, and as adhesions limited the field, gauze was packed about the opening, the child turned to the right side, and a half-inch cut was made into the sac. A dark green fluid spurted out, which had a strong, heavy odor of stale urine. About two quarts of fluid was evacuated, and the finger intro-

duced into the sac, which proved to be the bladder. The opening in the bladder was sewed up, adhesions binding the bladder on to the abdominal wall and on the right side to the large and small intestines were broken up, and the enlarged thick-walled bladder dropped back into the abdominal cavity. The appendix and appendiceal region, except for the presence of some adhesions, were normal. An opening was left in the abdomen for gauze drainage, and the rest of the wound closed up. The subsequent history was that the bladder was emptied by means of a retention catheter for forty-eight hours, after that catheterization night and morning for three days. There was a gradual decrease in pulse and temperature, and in seven days both were normal. On the third day a quantity of fluid drained out through the opening, but this gradually ceased, and on April 23, sixteen days after operation, the abdominal wound had closed, and the patient is now in good health.

Gunshot Wound of the Abdomen.

DR. JOHN D. S. DAVIS, Birmingham, Ala., reported a case of gunshot wound of the abdomen, with eighteen perforations, in which he resorted to intestinal resection of five feet seven inches, with use of the metal button, followed by recovery of the patient. The patient, a woman, 23 years of age, while attempting to place a rifle in the rack on the wall, the gun was discharged with the muzzle about eight inches from the abdomen. The bullet, a 32-caliber, entered in the median line midway between the umbilicus and the symphysis pubis, ranging backward, upward and to the right, and was deposited in the muscles of the back on the right side. The ball in traversing the abdomen made eighteen perforations of the gut, and two cuts in the intestine that went to the mucous membrane. Sixteen of the perforations and the two sero-muscular wounds were in the small intestine, and two perforations in the transverse colon. The bullet cut two mesenteric arteries, which caused a large amount of blood to collect in the abdomen. Patient was shot at 4:30 p. m., Feb. 2, 1904, and was brought a distance of eighty miles on a freight train to Birmingham, by her physician, Dr. W. O. Watson, and carried to Hillman Hospital. At 9 o'clock Dr. Davis saw the patient and had her prepared for section. Temperature at this time was 102, and pulse 130. She probably had fever at the time she was shot. A seven-inch incision was made in the median line, a large quantity of blood turned out, and the bleeding vessels controlled by hemostatic forceps. The two perforations in the transverse colon were so near the mesenteric border that he stripped up the mesenteric serosa and turned the mesenteric border in as though the two openings, one on each side, had been one large opening, including mesenteric border, and closed with interrupted silk sutures. He then brought the mesenteric folds back and sutured over the wound. Four perforations and two sero-muscular cuts in the small intestine were turned in and closed with small loop silk sutures. Two perforations were situated so close together that they had to be closed by flexing, pouching or looping the mesenteric border, the bowel being bent on its convexity so that the two wounds could be closed as one large wound by interrupted longitudinal loop sutures—suture with axis of bowel. There were two other perforations that could have been closed by suture, but the openings were between two mesenteric perforations on one side and eight on the other, and he thought it better to lose one more foot of intestine than to do two resections. He resected that part of the intestine containing the ten mesenteric perforations (sixty-seven inches), including the two large perforations in the convexity of the ileum and closed with the third-sized metal button. The resected bowel and its mesentery were removed, the vessels ligated, and the gap in the mesentery closed with interrupted silk sutures. The abdomen was flushed with hot normal salt solution; plain gauze drainage was used, and the abdomen closed with through-and-through silkworm gut sutures. The operation lasted one hour and a half. Drainage was removed on the second day. Patient passed the button on the twenty-first day and left the hospital March 1, 1904. A week later she was doing housework, and was perfectly well.

(To be continued.)

Miscellany.

TRAVEL NOTES.

OUR POSSESSION IN SAMOA FROM A MEDICAL STANDPOINT.

NICHOLAS SENN, M.D.
CHICAGO.

AUCKLAND, NEW ZEALAND, July 25.

We landed at Pago Pago on Thursday, July 21, at 6:30 a. m. The natives were on hand to welcome us, and many a greeting was expressed in the euphonious word *"talofa"* (love to you). The moment the ship was anchored in the harbor a fleet of canoes surrounded it and their brown inmates in native attire—men whose only garment was a breechcloth, women in the loose, comfortable Mother Hubbard calico dress, children with no clothing incumbrances of any kind, all of them with a copious growth of jet black long curly hair freely exposed to sunlight and breeze, with upturned faces and large, gentle, imploring coal black eyes—were soliciting patronage for the products of their charming island. Gaudily painted tapa cloth made of the bark of a tree, coral beads, baskets of various designs and sizes, shells and tropical fruits were the principal articles offered for sale. The competition between the dusky vendors was not a spirited one; it made little difference who reaped the greatest profits, as in a short time the gain of the morning's sales, according to the customs of the island, would soon be shared equally by all. Our time in the harbor being limited to a few hours, I was very anxious to improve every minute in studying the resources of the island, its people and their diseases. By previous appointment I was met on board by Dr. H. E. Odell, P. A. Surgeon U. S. Navy, the medical officer of the training ship *Adams*, now in the harbor (Fig. 1). To this officer I am greatly indebted for many charming courtesies and most valuable information. He took me ashore at once in the government launch and on landing introduced me to Chief Pan Pan of the village Aua, who happened to be present, a man highly esteemed by the natives and whites for his excellent character and good judgment. His distinctive dress consisted of a long white coat, with shoulder-straps of the same color with a narrow border of blue. His whole bearing impressed one with the dignity of his office and firmness of his character. From the time we entered the harbor until we reached the shore I had looked in vain for the American flag. I saw the bare, tall pole in front of the custom-house and was wondering what had happened in international politics since I left San Francisco, that it should have been stripped of our colors. The information came without asking any questions. A few minutes after landing a motley crowd gathered around that pole and presently I had the pleasure of witnessing the hoisting of the American flag (Fig. 2). This is a ceremony that takes place every day at 8 o'clock in the morning. The moment the Stars and Stripes reached the lofty destination, fluttering in the fresh morning breeze, the native band played our national airs, "My Country, 'Tis of Thee" and "Star Spangled Banner," and the mountains re-echoed the strains of the stirring music so dear to the heart of every American. The ceremony was an impressive one. The native guard, composed of 72 picked men, magnificent specimens of physical development, wearing a red turban, white sweater and blue trousers, stands at attention with arms at rest. The crowd of people, including many children, stood motionless, not a word being spoken until the last strains of the music had died away in the soft, balmy air of the tropics, when the guard shouldered their arms and marched away to their respective posts of duty in a truly soldierly manner and the crowd dispersed as quietly and silently as it had gathered. This beautiful ceremony reminded me that I was on American soil in the midst of the vast trackless Pacific ocean, nearly 5,000 miles from the western limits of the United States.

SKETCH OF THE HISTORY OF THE ISLANDS OF SAMOA.

Not all the people of the United States are aware of the fact that the beautiful island of Tutuila of the Samoan archipelago

is one of our ocean possessions and very few know how it was acquired. In making inquiries among officers and passengers of the *Sierra* regarding this subject I became satisfied how little there is known about it. The history of Samoa, especially the recent part of it, leading up to the time Tutuila was ceded to the United States, is a very interesting one and does not reflect much credit on some of the foreign powers, especially Germany. The extent to which Germany meddled with Samoan affairs and the fact that she now owns the two largest islands, Savaii and Upolu, are matters difficult to explain. The recent history of Samoa is a tangle difficult to unravel without losing the thread owing to the rapidity of succession of events caused by contending internal political factions, complicated by outside interference. Space will permit me only to give a few outlines. The Samoan archipelago, composed of not less than fourteen volcanic islands with numerous adjacent islets, lies nearly east and west between the parallels 13° 31′ S. and 14° 31′ S., and longitude 172° 45′ W. and 168° 9′ W. The last volcanic eruption occurred in Savii in 1866. The islands were first seen by Roggeveen, but their discovery is generally accredited to Bougainville, who came there in 1768 and stocked them with domestic animals. He called them Navigator Islands. It is supposed that the islands became populated by Polynesians migrating eastward from Sumatra, via the Philippines and Hawaii, by a party of less than fifty, in seven canoes. Two hundred years later the Tongans invaded the islands and, with the aid of Fijians, drove the Samoans into the mountain retreats. The hardships endured by constant persecution served to strengthen the Samoan forces, who finally gained the upper hand and cleared the two largest islands, and later all of them, of the invaders. Cannibalism was introduced by the Tongans, but was abandoned before the arrival of the explorers. The missionaries came in 1833, and one of the first fruits of their indefatigable labor was the conversion of Malietoa, one of the most powerful chiefs, who was christened Davita. This event gave rise to a religious wave which soon reached the different islands.

Frequent strifes between the different islands and tribes induced the natives to look to the United States as early as 1872 to establish order out of chaos by requesting our government to send Colonel Steinberger of New York as adviser. Two years later President Grant granted the request. The colonel soon improved the administrative affairs of the islands and had the full confidence of the natives. His influence excited the envy of the British and in less than a year he was deported by a British warship, no protest being made by our consul, and the unwarranted action had the full sanction of King Malietoa Laupepa. Insurrection followed and the king was deposed. From now on the political events followed in rapid succession by the aggressive interference on the part of Germany. Talavoa was elected king, but died after a short tumultuous reign, and Laupepa again succeeded to the throne only to be again deposed in 1888, when he was exiled by the German fleet. Insurrection under the leadership of Malietoa Mataafa again unsettled political affairs. At one time the German, English and American warships in the harbor of Apia were ready to clear the decks and begin war between Germany on one side against the other two powers, when the great storm swept them out of existence with the exception of the English gunboat *Calliope*. Active interference on the part of the United States resulted in the Berlin conference, which declared in favor of Laupepa against the protests of the natives. With the assistance of a German and British warship Laupepa defeated the forces of Mataafa near Apia in 1893, who shortly afterward surrendered to the British and was exiled to the island of Jaluit with twenty of his chiefs, where he remains at the present time. On the return to power Laupepa abdicated in favor of Mataafa, but European diplomacy again interfered and he remained on the throne. After Laupepa's death in 1888 came the contest between the exiled Mataafa, who had the German influence, and Tana, the son of the dead king. After a number of fierce contests the matter was referred to Chief Justice Chambers, who decided in favor of the heir to the throne. Finally Admiral Kautz of the battleship *Philadelphia* interfered and insisted that both contesting parties should lay their claims aside. England now withdrew from the contest, leaving the Germans and Americans in the field to dispose of the islands. A satisfactory agreement was reached by which, on Nov. 8, 1899, the two largest islands, Savaii and Upolu, were ceded to Germany, and Tutuila with its magnificent harbor became the property of the United States.

OUR SAMOA ISLANDS.

Out of the internal dissensions and whirlpool of foreign interventions arose for us, phoenix-like, Tutuila, the most beautiful, and, from a strategic standpoint, the most important of the Samoan Islands. Pago Pago harbor is land-locked, with an average of thirty fathoms in depth and sufficiently large to give protection to a fleet of from six to eight of the largest men-of-war, with a strip of land belonging to it amply large for government buildings, barracks and coal sheds. The harbor is hemmed in by mountains on all sides, from 1,500 to 2,500 feet high, except the narrow gateway communicating with the ocean. These mountains form a safeguard against any hurricane, no matter how severe it might be. The entrance is so narrow that a few mines and a battery on the high hills on each side could keep the largest naval force at bay. The island is 10 miles long and 230 in circumference. A number of islets belonging to it and included in the treaty stretch along the same east and west line, the farthest about sixty miles away. The main and adjacent islands are forest-clad, without a bare spot in the dark green carpet, extending from the shores to the highest mountain peaks. The primitive forests have never been disturbed, as the natives have had no use for timber either for themselves or barter. The forests are dense, almost impenetrable, and some of the trees, especially at the very summit of the mountains, are of prodigious size and would yield hardwood timber of great commercial value. The rim of lowland at the base of the mountains, when it exists, and the valleys near the shore line, are covered with groves of cocoa palms and wherever a sufficient number of these trees are found a hut or a small hamlet of huts may confidently be looked for. The volcanic formation of the entire island is covered with a thick layer of the most fertile black soil, as shown by the size of the trees, the luxuriance of the shrubs and plants and the abundance of nutritious grass. The soil and climate are admirably adapted for the growing of coffee, cacao, taro and all kinds of tropical fruits.

CLIMATE.

The climate of Tutuila is influenced by the unbroken, dense, virgin forest. We see here a very instructive example of what such forests are capable of accomplishing in the way of securing an adequate rainfall. Drought is unknown. The rainy season in the Samoan Islands is supposed to be during the first three months of the year, but in Tutuila it rains more or less throughout the year, rendering the atmosphere damp. The rainfall last year, according to Dr. Odell, reached nearly 200 inches. Every ravine leading from the mountain heights to the sea has its rivulets or small rivers, which drain off the excessive moisture of the saturated soil, furnishing the inhabitants all over the island with a faultless water supply. The climate is uniform, the tropical heat modified by sea and land breezes. The temperature seldom rises above 85 degrees F. and is rarely less than 72 degrees F., although on rare occasions the thermometer has registered as low as 60 degrees F. (Odell). The nights are generally delightfully cool. The climate is, on the whole, very similar to that of Hawaii.

THE PEOPLE.

"They eat, they drink, and in communion sweet
quaff immortality and joy."—Milton.

The Samoans are a noble race, simple, honest, affectionate, peaceable and hospitable. The men are splendid specimens of physical development, above average size, and with a courteous and noble bearing. I observed several women who were close to the six-foot mark and as erect as the poles of a bamboo thicket. I noticed that many of the women and some of the men had dark brown hair, which, I was informed, was the result of a process of bleaching with lime, done either with the

intention of ridding it of its living inhabitants or for cosmetic reasons. The women are rather fair-looking when young, but lose their attraction before they reach the age of 30 by premature old age and obesity. Tattooing among men remains as a national custom. It is done as a ceremony as soon as the boys attain virility and the field of operation corresponds with that part of the body covered by their only garment—the breechcloth—so that in the event anything goes wrong with this, the simplest and oldest dress, they should not appear entirely naked. The operation is performed by experts, whose implements consist of a little fine-toothed comb made of the tusk of the wild boar, which is fastened to a small stick in the form of a minute rake. The teeth are dipped into the staining material, and with blows of a little stick on the blunt end of the comb they are made to penetrate deep enough to drive the stain into the deeper layers of the skin. The operation is attended by great pain and lasts, according to the artistic designs employed, from five hours upward. The lines of tattooing are exceedingly fine and the patterns are often quite artistic, as I had an abundance of opportunity to observe. There is very little crime among the Samoans. For four years there has been only one murder in Tutuila with its 6,000 inhabitants. The whites never lock their doors. What we look on as petty thefts, such as taking away without permission a loaf of bread, a fish or any kind of fruit, is not regarded in the light of crime by the childlike Samoan. The next day the neighbor so treated will even up the account in a similar manner. So far as the food supply is concerned, the Samoans constitute one great family, giving and taking as occasion may demand, and the stranger is always welcome to more than his share. Family life is ideal. The father rules supreme; old age is respected; the ties of relationship and friendship are strong. No operation can be performed on a Samoan without a previous family council. If the father is the patient the sons decide the matter; if any other member of the family is concerned the father alone has the power to object to or sanction the operation. The bedside of the sick is never deserted by the immediate members of the family, and anxious relatives and friends are never far away.

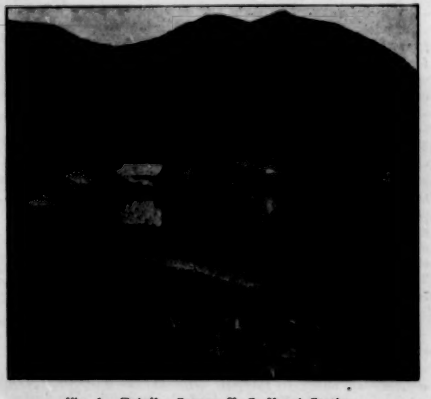


Fig. 1.—Tutuila, Samoa, U. S. Naval Station.

The educational advantages of Tutuila are as yet in their infancy, a defect which should soon be remedied, as the children are very fond of school work. The Catholic Sisters have been here, and, as on so many other frontier lines, they are the pioneers in placing within reach of the ignorant children the means of obtaining an education. They have opened a school in a village near Pago Pago, which is already filled to overflowing with the little dusky scholars. All of the inhabitants are nominally Christians, but religion has failed to wipe out many traces of paganism. There are very few legal marriages consummated. The native custom still prevails. Man and wife consent to live together, and continue to do so as long as the matrimonial sky is clear, but should anything occur contrary to the expectations of the husband the tie is severed by returning the wife to her parents or relatives. The children are always provided for. Unless other arrangements are made which are satisfactory to both parties, the sons remain with their father and the daughters accompany their mother.

The kahuna, or native medicine man, remains, and has not lost his influence among his people. They continue their mysterious ceremonies and the use of herbs and roots in battling with the diseases they are called on to treat. The remarks of Father Damien concerning the native doctors of Hawaii apply to the kahunas of Samoa: "We have to fight their doctors, who are generally nothing but sorcerers. In cases of sickness idolatrous sacrifices are still in use. All diseases are attributed to mysterious causes. It is very hard to disabuse these poor people of such superstitious notions." Superstition remains unshaken by the teachings of the gospel, a strong proof of the truth that

> "Nothing has more power over the multitude than superstition; in other respects powerless, ferocious, fickle, when it is once captivated by superstitious notions, it obeys its priests better than its leaders."—Quintus Curtius Rufus.

PRESENT FORM OF GOVERNMENT.

Our government has very wisely interfered as little as possible with native rule. The harbor, with a strip of land belonging to it, is exclusively under the control of the officer in command of the naval force stationed there. He is at the same time the commandant of the island, to whom the chiefs can appeal in all matters in which they find it necessary to obtain advice, or when they fail to adjust local difficulties in their respective communities. The naval surgeons stationed at Pago Pago have in charge the sanitation of the island and the care of the sick poor natives. They have already succeeded in securing for Pago Pago, a village of 1,500 inhabitants, a pure water supply and many other sanitary improvements. The greatest fault with the Samoans is their inborn laziness. They will not work. The government has now under way many improvements, and, although the wages for this part of the world are large, $1 a day, it had to import laborers from other islands to do the work. Civilization has rather increased than diminished this inherent repugnance to labor.

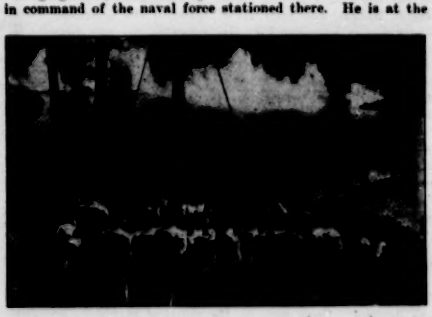


Fig. 2.—Flag-raising ceremonies.

KAVA DRINKING.

Kava is the national drink of the Samoans. They have not, like our Indians, an ungovernable desire for alcoholic stimulants. Kava is the fleshy root of *Piper methysticum*, a succulent plant about four feet in height, with large, long petioled leaves. In propagating the plant all that is necessary is to break off one of the leaves at its point of insertion, including the bulbous base of the petioli, and stick it into the moist, rich, black soil. Kava drinking is a ceremony. Dr. Odell was kind enough to

give me an opportunity to observe this ceremony in all its details and to sample the product. Whenever possible the drink is prepared by a young woman, who always regards the task as obligatory, as well as a privilege, if not of distinction. The first young lady that passed Dr. Odell's bachelor quarters was called in, and she went through the entire performance with a grace and elegance that showed that she was no novice in that part of her domestic functions. Formerly the root, fresh or dried, was chewed by young women. Now the dried root is crushed on a stone, and the coarse powder is placed into a shallow bowl of hard wood, supported on very short legs, the pride of every Samoan family; it is to them what the samovar is to the Russians. After pouring cold water on the pulverized root it is stirred vigorously with both hands for about five minutes, when the straining is commenced with a swab of bark fibers, which is continued until all coarse particles are removed from the soapy-looking liquid; the entire time required being about fifteen minutes. The liquid has a peppery, rather pleasant taste. It is served in cups of carved cocoanut shell. This drink suits the place and climate better than any other beverage. In larger quantities it produces a form of slight intoxication, in moderate quantities it is a diuretic and slight soporific.

NATIVE HOUSES.

The natives remain true to their original architecture in the construction of their houses. The houses are circular, open, the round dome-like thatched roof resting on poles. The rafters are made of the bread-fruit tree, held together and fastened to the upright poles with an intricate lacework of bark and twigs. The ground is covered with gravel. The bed consists of tapa mats, and the pillows are bamboo sticks, as large as the arm of an adult, supported by props at each end, about four inches in height. The cooking is done outside. As there is no other furniture in the house the domestic duties of the female part of the family are certainly of the simplest kind. The tapa cloth is made of the thick, soft bark of a tree; it is pounded into thin sheets, dried and painted in figures most pleasing to its future owner. It is the principal article of barter, and its abundance or scarcity constitutes the wealth or poverty of the family. These open houses and the frugal diet are most conducive to the preservation of the native's health. Indoor air, combined with the inherent inactivity of the natives, could not fail in multiplying disease and increasing the death rate.

DISEASES.

Samoa, like all islands of the South Pacific, has lost its full share of population from the effects of the infectious diseases introduced by the whites, notably measles, smallpox and tuberculosis. Vaccination is now generally practiced by the naval surgeons, and the natives subject themselves willingly to this prophylactic measure. The spread of infectious diseases among the natives is favored by their habits. Their affectionate nature and the strong ties of friendship bring relatives, friends, communities and different villages in continuous and frequent contact with the afflicted, and in this manner infection is carried in all directions, and in a remarkably short time by progression from place to place will reach the most remote parts of the island. I imagine that any efforts to cut off free communication between the sick and well would appear as an infliction of cruelty to the natives, and would meet with their displeasure, if not persistent opposition. It is this free intercourse among the people that accounts for the rapid spread of measles and other acute infectious diseases over the entire island. The natives have absolutely no comprehension of the importance, much less of the necessity, of enforcing sanitary precautions.

Tuberculosis affects most frequently the lungs, as this organ becomes most frequently predisposed by catarrhal affections, which are very common; next in frequency are the bones and joints, and lastly the lymphatic glands and intestinal canal. Leprosy is unknown in Tutuila. On the other hand, elephantiasis is very common. It is estimated that of the male population over forty years of age 50 per cent. are suffering from this disease. It attacks in preference the lower extremities, but not infrequently the upper become involved, and scrotal elephantiasis is by no means rare. Dr. Odell has operated on a number of cases of scrotal elephantiasis successfully, in which the mass removed weighed twenty and more pounds. The disease is much more common in men than women, undoubtedly because they are more frequently the subject of lesions, which determine infection. The disease is occasionally met with in children less than ten years of age, and not infrequently in young men at the age of twenty. There are only about 50 whites in the island, and one of them, a German, had been a resident for thirty-two years. He married a native woman and raised a large family of children. He is now 57 years old, and contracted the disease twelve years ago. It affected the right leg, pursued a somewhat acute course, and recently a complicating affection of the knee joint made an amputation of the thigh necessary. He made a good recovery, and will leave the hospital in a short time for his island home. This case, like so many others, proves that a prolonged residence in a tropical climate renders the whites susceptible to infection. Skin affections are very prevalent in the island,

Fig. 3.—Tamasese. Fine specimen of Samoan.

more especially ulcers of the leg. The lack of clothing and footwear is undoubtedly largely responsible for this, exposing the parts to all sorts of mechanical irritation in walking through the dense bush and along the stony, pebbly shore. These ulcers yield promptly to treatment by rest, and the local use of antiseptics. Another common affection is the so-called tropical abscess, a deep-seated, somewhat subacute phlegmonous inflammation, attended by only slight constitutional disturbances. It is undoubtedly the result of infection through surface lesions which are so common, that is, the entrance into the tissues of some mild form of pus microbe through a surface infection—atrium. These abscesses heal very promptly after incision and drainage. The frequency with which hydrocele is met with is attributed by Dr. Odell to *Filaria sanguinis* infection, but he has encountered no difficulty in effecting a radical cure by the usual operative treatment. Among the skin affections yaw figures very largely. Dr. Odell showed me a little girl suffering from this disease. The lips and lower segment of the face were covered with very super-

ficial weeping ulcers. He relies on mercury and chalk incorporated in a salve in its treatment, and has never seen this treatment fail in effecting a speedy healing of the ulcerated surfaces. Venereal diseases are not nearly as common in Samoa as in Hawaii or Tahiti, as the women are more virtuous, especially in their relations with white men. The humidity of the climate, the cool nights, absence of clothing, inadequate cover during sleep, are responsible for the frequency with which diseases of the respiratory organs prevail. Pneumonia occurs in a somewhat mild form, as the mortality is not great. Epidemics of influenza sweep over the island almost every year, and affect young and old, but the disease is mild. Typhoid fever is unknown Malaria in certain localities is quite common, but always of the mildest type, yielding readily to the internal administration of quinin. Diarrhea among infants and children, caused by improper diet and exposure, is a very common affection throughout the entire year. The question has often occurred to me whether or not appendicitis is as frequent among the people who live largely on breadfruit, bananas, and cocoanut, that is a laxative vegetable diet, as it is with us, who are more imprudent in the matter of diet. That the disease is rare in the islands of the South Pacific I am sure, that it does occur is shown by a case recently operated on at Pago Pago by the predecessor of Dr. Odell. The patient made an excellent recovery. Dr. Odell has been at his present post since December, but so far, has not seen a single case, although his clientele is very large. Dysentery as observed here, is not a common disease, and yields readily to treatment. The island has so far escaped the ravages of scarlatina and diphtheria, the scourges of childhood in most of the civilized countries. The sanitary condition of the island appears to have been improved during the last few years, in consequence of which the population is now increasing.

HOSPITALS.

The plural number of this subheading will undoubtedly astonish the readers. Pago Pago is the only place in the island that affords hospital facilities, and this is a village of not more than 1,500 inhabitants, and our naval force does not exceed 120 men. Nevertheless, it has two distinct hospitals adjoining. One is a small, one-story cottage, with four small rooms, in which all the operating is done and in which the more serious cases and the soldiers are cared for. It would be difficult to crowd into this hospital more than twelve or sixteen cases, and yet it has met, so far, the urgent needs. The second hospital is a unique one. It is nothing more nor less than a large native house, built by the natives, for which the government paid them $100. The cots furnished by the government are the only articles of furniture. The natives can come and go as they please, as they take care of themselves. Men and women live under the same roof. In case of an emergency about twelve patients could find shelter here. Its greatest merit is the perfect ventilation. At the time of my visit I found here three patients, one woman recently operated on for extrauterine pregnancy, a man affected with elephantiasis, and another one the subject of extensive ulcers of the leg. These patients have no lack of nurses, as a crowd of relatives and friends is always in attendance. Dr. Odell attends to their medical and surgical needs.

The obstetrical work in the island is attended to by neighboring women. The patient, as well as the improvised midwife, have only one thing in view when a new Samoan is on his way into the world, and that is to shorten the ordeal as much as possible by a combination of muscular force on the part of the patient and her attendant. It speaks well for the climate that, notwithstanding even ordinary cleanliness on such occasions is ignored, to say nothing of modern aseptic precautions, and a maximum of force is brought into play, sepsis very seldom follows, and the mother resumes her customary, routine household duties the next day. These strenuous deliveries, as a matter of course, result in extensive lacerations of uterus and perineum.

One death from puerperal sepsis came recently under the care of Dr. Odell. It was a case of retained placenta, in which general sepsis had developed before he was called. In spite of prompt extraction of the putrid mass, and thorough disinfection, the patient succumbed to acute sepsis. Dr. Odell has performed three successful laparotomies during his residence in Pago Pago: 1. Ovarian tumor. 2. Dermoid of ovary. 3. Ruptured extrauterine pregnancy. Patients take anesthetics well, and wounds heal promptly. Myofibroma of the uterus does not appear to be as common in the women of the South Seas as is generally supposed; on the other hand, lipoma in all its favorite localities is very frequently met with in both sexes. It will, in conclusion, interest the readers to know that our island in the Pacific has a newspaper in the native language, published every month at government expense and distributed gratuitously among the inhibitants. Through this medium they receive the local news and keep in touch with the outside world.

Therapeutics.

[Our readers are invited to send favorite prescriptions or outlines of treatment, such as have been tried and found useful, for publication in these columns. The writer's name must be attached, but it will be published or omitted as he may prefer. It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in everyday practice. Proper inquiries concerning general formulae and outlines of treatment are answered in these columns without allusion to inquirer.]

A Substitute for Milk in Intestinal Diseases of Children.

Helprin, in the *Med. Record*, recommends the following, which may be used in place of barley water when that mixture becomes monotonous or distasteful: "Two tablespoonfuls of ordinary flour in an agate dish retained in an oven till the flour is well browned, then blend or dissolve in a little cold water; this is now gradually added to, and stirred in two pints of water while boiling. This may be given in three-ounce apportions, and ten feedings. One-half dram, gradually increased to a dram and a half, of condensed milk, can, in the course of a day or two, be judiciously added to each feeding." Other preparations of the same class include cornstarch and granum.

He also recommends the following prescription to be used to hold a diarrhea in check:

℞.	Bismuthi subnitratis	3v	20
	Bismuthi salicylatis	gr. xii	75
	Syrupi rhei aromatici	3iii	12
	Aquæ dest. q. s. ad	3iv	120

M. Sig.: Teaspoonful every two to four hours.

For the same condition Kerley recommends the following:

℞.	Bismuthi subnitratis	3v	20
	Sulphuris sublimatis	gr. xxx	2

M. Ft. chart. No. xxx. Sig.: One powder in a tablespoonful of water every two hours. The effect is soon evidenced, but it is best continued for some time.

Illuminating Gas Poisoning.

Hubbard, in the *Med. Record*, reports a case of poisoning by illuminating gas, and recommends early venesection, followed by a saline infusion. The author believes that this method deserves more recognition than has been accorded it in recent years. Cases have recovered after having been exposed to the gas for from six to twelve hours. The chances of recovery decrease with every hour of delay in operating.

AMOUNT OF BLOOD TO BE TAKEN.

There is no definite rule, the amount must be determined by the condition of the pulse. More often too little is removed than too much. When the pulse becomes feeble it is time to stop. The change in the rate is of no great value as an indicator. The amount of saline to be injected is likewise dependent on the pulse character. When the radial gives a full, steady pulse beat, sufficient infusion has been used.

In regard to the advisability of a second blood-letting the author states that if four or five hours have elapsed with no marked improvement in the respiration, and no return of consciousness, a second venesection may be indicated, more

caution being required in judging the amount of blood to be withdrawn.

Hiccough.

The *Med. Times* suggests the following: Chloral is perhaps the most generally useful drug in idiopathic hiccough, given to an adult in doses of ten grains (or even twenty grains) every hour until from sixty to eighty grains have been used. If after four or five hours the spasms still continue, it will be inadvisable to go on with the chloral. Many times a sharp counter-irritation on the surface of the epigastrium will stop the attack, used with or without the chloral internally. The simple act of sneezing will sometimes promptly check hiccough.

Cerebrospinal Meningitis.

Berg, in a recent number of the *Med. Record*, discusses the clinical and other features of the recent epidemic of this disease, and gives the following outline of treatment:

LUMBAR PUNCTURE.

The lumbar puncture is made and repeated only when, after a period of improvement, the temperature again rises, and symptoms of increased intraspinal and intracranial pressure occur, such are total abolition of the patellar reflex, slowing of the pulse, Macewen's symptom, increase in the Kernig phenomenon, increase in the delirium and stupor. If the cerebrospinal fluid flows from the canula in a continuous stream under tension the withdrawal of 15 to 30 c.c. of fluid will do much good. If it escape drop by drop, or if the puncture be a dry tap, there will be no therapeutic result. Sodium iodid is given in from 5 to 10 grain doses every three hours for a child over a year old, and from 15 to 20 grains every three hours for an adult. In adults, also mercuric ointment in doses of 15 grains is rubbed into the back of the neck twice daily until the gums are red. In older children the amount used is about equal to the size of a bean, and rubbed in several times a day. In children with open fontanelles the oleate of mercury in proper doses is rubbed into the anterior fontanelle.

FEVER.

When below 102 F. no treatment is required, above 103 F. use a warm bath at 80 F. in which the patient remains five minutes, the temperature of the bath is then raised to 90 F., and the patient is allowed to remain five minutes more. The bath not only reduces the temperature, but induces quiet and rest.

GENERAL CARE.

1. Large, light, airy room with thorough ventilation.
2. Care and cleanliness to avoid the occurrence of bedsores.
3. Cleanliness of the nose to prevent deeper infection through the nasal cavities.
4. Daily examination of the ears; a timely paracentesis of the drum membrane in suppuration of the middle ear may prevent a subsequent mastoid disease.
5. Care of an incipient conjunctivitis to prevent a panophthalmitis; the eyes should be protected from the light by means of a shade and not a darkened room.

Pulmonary Tuberculosis.

Pottenger, in a recent number of *Amer. Med.*, discusses the rôle of the general practitioner in the prevention of this disease: There are three factors in the etiology of tuberculosis which must be understood in order to properly and intelligently administer prophylactic treatment.

1. Soil.—There will be no disease even though the bacilli be present unless the soil is suitable; the body cells must lose their natural resisting power. Under normal conditions the cells are very resistant to the growth of the tubercle bacilli. This fact is proven by the great prevalence of the tubercle bacilli and the great number of healed foci found in postmortem examinations which were of no clinical significance, in fact were never recognized before death.

2. Bacilli.—It is an established fact that the tubercle bacillus is the specific cause of tuberculosis, yet it is very questionable if it is capable of producing the disease in a healthy individual, unless it be from a very virulent culture or the inoculation be one of great numbers.

3. All influences which lower the normal protective power of the cells must be carefully guarded against. (*a*) By living a natural hygienic life. Sunshine, fresh air, good food, cleanliness, proper regard for the functions of the various bodily organs, and good habits will do much toward preserving the natural defensive powers of the body cells. (*b*) Avoid those things which actually lower vitality, such as overwork, especially under bad hygienic conditions; overcrowding, in rooms badly ventilated and poorly lighted; underfeeding; excesses, especially alcoholic and venereal; disease; mental disturbances, worry over real or imaginary troubles and depression from other causes.

The author elaborates further by advocating that a maximum number of hours should be designated as a day's work, varying according to the ages of the workers and the character of work done. Workshops, offices and dwellings should have certain requirements as to floor space per occupant. The poor should be encouraged by low rents and cheap and rapid transportation to reside in the suburbs. Greater care should be taken by the physician in the after-care of those diseases which are known to be frequently followed by tuberculosis, e. g., la grippe, typhoid fever, and measles.

DESTRUCTION OF THE BACILLI.

This is largely a matter of education and honor, and its accomplishment depends almost entirely on the medical profession. Physicians should have an accurate knowledge of the method of spread of the infection, which should be combated by instruction, by the family physician in the well-to-do classes, as to the careful disinfection of the sputum and other bacillus-bearing discharges. The patient should be told of the nature of the disease in order to gain his intelligent co-operation. The great majority of cases are among the poorer classes, and the instruction of them should be placed in the hands of the proper health officers. In order for the health officer to obtain results he should assist and be assisted by the family physician:

1. Cases should be reported to the health authorities.
2. Occasional circulars should be issued by the health department and sent to the physicians.
3. Instruction of the poor should be done by the health authorities, in matters of hygiene and disinfection. Several assistants should be appointed who, with the help of a corps of trained nurses, should visit the homes of the tubercular poor and make them hygienic. This work could be materially aided by the establishment of a free dispensary for tuberculosis. Such a dispensary to provide sputum cups and disinfectants and it would be an act of mercy if such foods as milk and eggs could be given to those who were in need of them.

EARLY DIAGNOSIS.

Of the great advantage of early diagnosis the author says: "It is conservative to say that if the disease were diagnosed, as it can be, in its very incipiency, at least 75 per cent. could be restored to health by intelligent treatment." Therefore, examine all suspicious cases.

Medicolegal.

Crying as Evidence of Injury.—The Supreme Court of Alabama says, in Montgomery Street Railway Company vs. Shanks, a personal injury case brought by the latter party, that crying is often symptomatic of pain, and, in connection with the other evidence of actual hurts received by the plaintiff, the fact that she cried all the afternoon of the accident was admissible in evidence as of the essential circumstances of the injury, as was also the fact that she complained of pain the next morning.

Entitled to Compensation for Pain from Operation.—The Supreme Court of Michigan says that, in the personal injury

case of Beattie vs. City of Detroit, testimony was allowed to be given as to the cost of an operation. The jury were also instructed that the plaintiff was entitled to compensation "for the pain she may suffer from an operation, if an operation is deemed necessary." The court holds that there was no error in this, it being the opinion of the physicians who testified in the case that the injury would not yield to medical treatment, but could be cured by surgical operation.

Drinking of Liquor Before Commission of Crime.—The Supreme Court of Iowa says, in the homicide case of State vs. Busse, that the crime charged involved the condition of the defendant's mind at the time of the killing and evidence of intoxication could be considered by the jury in determining his mental condition. But the court goes on to say that it knows of no authority holding that the mere fact that an offender drank liquor shortly before committing the crime will constitute such evidence of intoxication as to require the question of its effect on his mental condition to be submitted to the jury. It is the mental confusion produced by liquor which is receivable on the question of intent of premeditation and not the fact of liquor having been taken; for it is a matter of common observation that one man may drink a considerable quantity of liquor without being affected thereby mentally or physically while another may be seriously affected by a small drink.

Expert Evidence and Privilege.—The Supreme Court of Missouri, Division No. 2, says, in the personal injury case of Holloway vs. Kansas City, that it was insisted that there was error in admitting in evidence the expert opinion of the plaintiff's physicians as to the cause of her physical condition, based on the previous history of her case as they learned it from her; that the correct method is to prove cause by hypothetical question based on facts in evidence. That the opinion of an expert witness is permissible when based on his personal knowledge of the matter under investigation, or on competent evidence in the case, or on both, the court says, is well settled; but the question here was whether a physician who testifies as an expert should be allowed to express his expert opinion based on the previous history of the patient as he learned it from her personally in consultation with her in respect to her ailments. The conclusion is that it was error to allow an expert witness to give his opinion based on the history of the plaintiff as he learned it from her in diagnosing her case, or while treating her. The court says that the statements of the plaintiff with respect to her past physical condition were mere hearsay, and should not have been considered by the expert in expressing his opinion as a witness as to her physical condition at the time of the trial. The decided weight of authority and the better reason support this contention. But a conversation between a patient and physician in regard to the former's doctor bill, or in regard to a contemplated lawsuit, the court holds is not privileged, it not being "information necessary for the physician to enable him to prescribe for such patient as a physician, or do any act for him as a surgeon," within the purview of the statute. That the plaintiff could not sever her privilege, and waive it in part and retain it in part, the court also thinks clear. And, if she waived it at all, then it ceased to exist. That she did so waive it when she testified that a physician examined her, though not very thoroughly, and asked her about it, and she told him, and he examined her womb and back, is deemed too plain for discussion. However, such waiver should be restricted to such information as the physician acquired from her while attending her in a professional character, and which information was necessary to enable him to prescribe for her as a physician, or to do some act for her as a surgeon; and it is manifest that a conversation in regard to a contemplated lawsuit, or the plaintiff's doctor bill, did not come within the provision of the statute. But the court is not to be understood by these observations as meaning or intimating that the physician was not competent to testify as a witness to what the plaintiff said to him, if anything, in regard to bringing suit against the city for damages, and that if she would go into it they would be able to fix up his bill against her. Such statements were not within the meaning of the statute under consideration. On the other hand, the court does not agree with the contention that because the plaintiff, after testifying that her health was good, had answered, on cross-examination, that a physician had treated her for headaches, that she waived protection of the statute, and that the defendant had the right to the evidence of the physician for the purpose of contradicting her.

Vested Right of Physician to Payment as Per Contract.—The Supreme Court of Michigan says that, in the case of Kapp vs. Board of Auditors of Washtenaw County, the board of health of Freedom township, in said county, made a written contract to pay for the care of indigent persons affected by contagious diseases $10 per visit and 25 cents per mile going. After the services in question were rendered, but before the bill therefor was allowed, the legislature passed an act, giving it effect March 13, 1903, which provided for a change in the law giving the boards of supervisors authority to pass on the reasonableness of claims for services in caring for indigent persons, by direction of the board of health, whereas, before the allowance by the local board was usually final and conclusive on the board of supervisors. By reason of this the board of auditors refused to allow and pay the bill contracted in this case as above. The Supreme Court says that it was unimportant whether the township board of health might properly agree in advance on the price to be paid for such services or not, for the service was rendered at the request of that board, and the bill was audited and allowed by it. Had this allowance been made before the act took effect, it is clear that the board of auditors must have paid the bill, and that the physician's right could not, in such case, have been affected by the legislature. Did the fact that the allowance was deferred until after such act took effect justify the board of auditors in its action? The court's answer is that the physician rendered services under a law which made the county liable to pay for them on allowance by the local board. The amount was agreed on in advance. He had a vested right to such payment, when lawfully allowed by the local board, and it could not be taken away or impaired by legislation, as it would be if the supervisors were authorized to question its reasonableness. To much the same effect is the second decision of the Supreme Court of Minnesota in the case of Comstock vs. Board of Commissioners of Lesueur County, where it overrules the decision reported on page 1590 of THE JOURNAL of June 11, 1904. In this second decision it holds that chapter 238, page 378, Laws of Minnesota of 1901, changing the liability for expenses incurred in preventing the spread of contagious diseases from towns and villages to counties, did not change or abrogate contract relations then existing between individuals and such towns or villages. A contract existing at the time of the passage of that act, and under which an indebtedness against a village arose, may be enforced against it. Again, it says that at the time the contract here involved was entered into and the indebtedness incurred—at least the greater part of it—towns and villages are solely liable for all expenses of this kind. The rights of the parties became vested and fixed at the time the contract was entered into, and it was beyond the power of the legislature to impair its obligation, as between individual creditor and the town or village, by shifting the liability from the town or village to the county. The plaintiff in this action had the right to rely on and seek relief in accordance with the contract between himself and the village.

Current Medical Literature.

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

American Medicine, Philadelphia.

September 17.

1 *Intermittent Lameness and Other Nervous Symptoms of Peripheral Arterial Disease. Charles W. Burr.
2 The Roentgen Rays in Injuries Near the Wrist. M. I. Wilbert.
3 Eyestrain as a Causative Factor in Sinusitis. Wm. L. Phillips.
4 Administration of Chloroform and Ether; Comparative Notes of the Two Drugs. Thomas J. Strong.
5 Traumatic Emphysema of the Orbit and Lids. H. F. Hansell.

6 Contracture of the Neck of the Bladder. Thomas G. Youmans.

1. **The Nervous Symptoms of Peripheral Arterial Disease.**—These symptoms may be either paroxysmal or permanent; either motor or sensory. The one constant lesion in intermittent lameness is chronic arteritis. Aneurism, especially of the iliac artery, is not very infrequent. Intermittent lameness bears some resemblance to angina pectoris. Its rarity is apparent rather than real, and due to its not being looked for or thought of. Patients do not always present a typical clinical picture. The most striking thing is the absence of the pulse in the member or members affected. Many cases are thought to be rheumatic or neuritic, or even neurasthenic. Glycosuria is a frequent complication in both slight and severe cases. Often the disease resembles paralysis agitans without tremor, without festination and without speech defect, but with the wooden face and the waxy rigidity of movement. The morbid anatomy of the disease is much disputed. Some of these cases are spinal in origin, and there is found an overgrowth of the neuroglia and minute areas of softening, due to disease of the blood vessels in the spinal cord, but at other times there is only sclerosis of the peripheral arteries, with little or no spinal disease.

Boston Medical and Surgical Journal.

September 15.

7 *Obstructive Renal Retention with Anuria, and Its Treatment. Francis S. Watson.
8 Remarks on the General Principles of Management of Pulmonary Tuberculosis. S. G. Bonney.
9 The Gynecological Aspect of Mental Overstrain at Puberty and Its Influence on Development. Wm. Edgar Darnall.

7. **Renal Retention with Anuria.**—Watson's paper deals with those forms of renal retention only with which anuria is associated, and which originate in complete closure of the ureter or of the outlet of the renal pelvis. He presents an analysis of 200 cases published by different writers. Cases in which the diagnosis is reasonably assured, apart from the surgical treatment, subcutaneous injections of saline solution are useful with a view to delaying or mitigating uremic symptoms. In cases of calculus obstruction, hot hip baths and manipulation aid the passage of the stone. When the obstruction is due to a kink of the ureter produced by movable kidney, the patient's hips should be raised, the abdomen relaxed and an effort made to replace the organ in its normal position. As to operative treatment, a quickly performed lumbar nephrotomy is the operation which will best fulfill all the requirements. Speed in the performance of the operation is of the highest importance.

Medical Record, New York.

September 17.

10 *Malignant Disease of the Larynx. D. B. Delavan.
11 *Post-typhoid Perichondritis of the Larynx. F. Mayer.
12 *The Treatment of Pulmonary Hemorrhage. W. B. McLaughlin.
13 *Non-operative Treatment of Trachoma. Frank J. Parker.
14 *Malaria. R. Cadwallader.
15 Practical Hygiene in the Public Schools. R. S. Wilcox.

10. **Malignant Disease of the Larynx.**—Delavan's paper indicates the progress recently made in the study and care of malignant disease of the larynx and calls attention to certain special points of treatment which seem of sufficient value to demand investigation and discussion, such as the use of the *x*-ray and other means of producing radiant energy. Laryngectomy and tracheotomy are discussed in all their phases, and the author concludes that in properly selected cases early preliminary tracheotomy is without doubt a valuable measure. Improved technic, special skill and early recognition of the disease will continue to improve the results obtained from this operation.

11. **Post-Typhoid Laryngeal Perichondritis.**—Mayer refers to a case of this kind, which was published, in part, last year, in which a complete cure was effected by means of intubation. The special points of interest in the case are: 1. The unusual nature of its origin, a gradually increasing dyspnea requiring a tracheotomy one month after the patient was discharged as cured of the typhoid fever. Three months later an O'Dwyer tube was introduced, which was worn for six weeks. 2. The length of time the tube was worn—for three months, continuously. 3. The ease of deglutition after an intubation. 4. The use of the child's size O'Dwyer tube for a short time toward the last. 5. The cure by intubation. Nine months after the last extubation the patient's general condition is good; she has increased in weight and attends to her usual duties.

12. **Pulmonary Hemorrhage.**—McLaughlin's treatment of pulmonary hemorrhage is as follows: Immediately on the occurrence of the hemorrhage the patient is given a hypodermic injection of 1/100 grain nitroglycerin and 1/4 grain morphin. Adhesive straps are applied to the side of the chest from which the hemorrhage is coming and the patient is instructed to lie on that side. Six hours after, if the hemorrhage has ceased, the patient is moved to a summer house which has no sides and is practically out of doors. At the end of four days the straps are removed and the patient is given a week of rest cure in the open. Seven cases have been treated in this manner; four were of moderate severity and two very severe; one was not severe as to the amount of blood lost in a given time, but the bleeding extended constantly over a period of more than seven weeks, during which time all the coughed-up matter was stained with blood. In all cases the hemorrhage was promptly and permanently controlled, and in none of these was there any secondary rise of temperature.

13. **Trachoma.**—Parker says that the cases for operation should be selected carefully, inasmuch as much harm may be done by indiscriminate operation. Operation is not a radical cure, but merely a means to a cure and a shortening of the time of treatment. Post-operative treatment is of the greatest importance; without it there may occur relapses which are as bad or worse than the first attack. The general condition of the patient is of importance. Proper feeding and out-of-door life should be urged. Adenoids and other hindrances to development should be removed. The treatment should be continued until the patient is cured. An effort should be made to prevent the spread of the infection and to arouse the patient's interest in doing so. For this purpose Parker gives the following printed instructions to his trachoma patients: Trachoma is a contagious disease of the eyelids, which if neglected will cause suffering and injury to the sight. To avoid infecting others, those having the disease should observe the following instructions: 1. They should have their own towels, handkerchiefs, washcloths and toilet articles, and under no circumstances should they be used by others. 2. They should sleep alone. 3. Avoid rubbing or touching the eyes, as the contagion may be carried on the fingers and infect others through articles handled. 4. The hands should be cleaned often with soap and water. 5. Treatment should be attended to regularly and continued until pronounced cured by the physician. Parker's non-operative treatment consists of bichlorid rubbing, with the use of one of the organic silver solutions, night and morning; in the hard variety, he uses copper sulphate in place of the bichlorid.

14. **Malaria.**—Cadwallader gives a summary of our present knowledge of the etiology of malaria, and reports several cases, calling attention to a number of interesting clinical features. He believes that a pre-requisite to infection, or at least to symptoms, is a watery condition of the blood, and just in proportion to the total fluid in the body will be the severity of the disease.

New York Medical Journal.

September 17.

16 Suggestions on the Medical College Library. Eugene F. Cordell.
17 *Postmortem Examinations for Medicolegal Purposes. I. L. Poloszker.
18 The Present Condition of Tenontoplasty. (Continued.) Professor Vulpius.
19 *Trachoma and Some Diseases Resembling It. James A. Nydegger.
20 Notes on Uremia, Urea and the Urea Tests. F. L. Wachenheim.
21 *The Non-susceptibility of the Newborn to Measles. Edwin E. Graham.
22 *Insufficient Motility of the Stomach and Its Treatment. Dudley Fulton.
23 *Gonorrhea (?) in the Male. John Flanagan.
24 *Elevation of the Hips in the Treatment of Placenta Previa. Alfred King.
25 Our Relation to One Another. John M. Kennedy.

17. **Medicolegal Postmortems.**—Polozker believes that it is absolutely necessary that this subject should be taught in medical colleges, and from the practical standpoint only. The difference between the medicolegal postmortem and the pathologic postmortem should be emphasized. The modern methods of the coroner and the police department in the conduction of a murder case are deprecated, and a remedy for the evil is pointed out.

19. **Trachoma.**—Nydegger refers to the confusion in diagnosing between trachoma and other diseases of the conjunctiva, such as papillary conjunctivitis and follicular conjunctivitis. The subject of trachoma is reviewed in full.

21. **Non-Susceptibility of New-born to Measles.**—Graham reports a case which he believes shows the non-susceptibility of the infant at full term to measles. A woman, ill with a well-developed case of measles, gave birth to a healthy child presenting no abnormal conditions or symptoms. At no time was the child isolated from its mother; it was kept in the same bed, nursed at intervals of two hours, and treated exactly the same as if it were not exposed to the contagion of the measles. Although an older child developed a typical case of measles, the infant, six weeks after birth, presented no evidences of having contracted the disease.

22. **Insufficient Motility of the Stomach.**—Fulton's treatment of this condition is hygienic, medicinal and mechanical. The diet should be one that spares the motor powers of the stomach, and, therefore, the more feeble the motility the more liquid the diet, especially when there is obstruction of the pylorus. The feedings should be small and frequent, although each case is a guide as to the number of feedings per day that should be given. The medicinal treatment comprises the administration of 1/24 grain of strychnin, three times a day; dilute hydrochloric acid, freely diluted, in 20 or 30-drop doses after meals; teaspoonful doses of burned magnesia and sodium bicarbonate one or two hours after eating when excessive acidity exists. Fulton has obtained good results in these cases by giving a pill containing from ½ to 1 grain of creosote, with 1 grain each of pulverized rhubarb and soap. Of the mechanical measures, he uses abdominal bandages, lavage and internal faradaization of the stomach. Cases which do not improve under this treatment should be relieved by operative procedure before the strength of the patient is entirely spent.

23. **Gonorrhea.**—Flanagan emphasizes the fact that many cases of suppurative urethritis are diagnosed as specific and subjected to treatment which may prove harmful rather than otherwise. Treating a case of urethral inflammation, the physician should know exactly the nature of the trouble and use such treatment as the exigencies of the case demand.

24. **Placenta Previa.**—King briefly discusses the value of elevation of the hips in the treatment of placenta previa. The method is also applicable in excision of the rectum and abdominal hysterectomy, gravity operating in these cases as a great blood saver. The method is not described in text-books. It consists in inclining the patient's body to an angle of 45 degrees. This is really the Trendelenburg position, with the legs of the patient in the same plane as the body.

Medical News, New York.

September 17.

26 *Polyuria in Typhoid Fever. M. H. Fussell, H. S. Carmany and H. Hudson.
27 *Treatment of Acute Middle-ear Disease. John A. Donovan.
28 *Value of Early Incision of the Membrana Tympani in the Treatment of Acute Suppuration of the Middle Ear. Francis R. Packard.
29 *Contributions to the Pathology and Treatment of Acute Gonorrhea. Ludwig Weiss.
30 *The Diagnosis of Incipient Pulmonary Tuberculosis. G. W. Norris.
31 *Diagnosis of Advanced Tuberculosis. Frank A. Craig.
32 *Differential Diagnosis Between Pulmonary Tuberculosis and Conditions Resembling It. H. R. M. Landis.
33 *History Taking in Cases of Pulmonary Tuberculosis. Charles J. Hatfield.

26.—See abstract in THE JOURNAL, xlii, p. 1376.

27. **Acute Middle-Ear Disease.**—For the treatment of this condition Donovan prefers the curette, finger nail or nail curette. He considers ether and nitrous oxid far superior to chloroform for anesthetizing infants and young children. In older children and adults he uses cocain; in fact, a single application of 5 per cent. may be used safely even in young children. To affect a thorough cure, it is necessary to remove all hypertrophied lymph tissues, such as adenoids and enlarged lingual tonsils. The prophylactic treatment is all-important and should not be overlooked. In all diseases affecting the nasal pharynx reasonable precautions should be used to avoid tubal infection. With the first symptoms of earache he advises the use of heat and dehydrating remedies. If these do not produce beneficial results in a few hours, treat surgically. When possible, with a catheter, use a mild continuous stream of hot air early, and repeat in eight or ten hours. If these measures fail to relieve the symptoms within ten to twenty-four hours, make a free incision through the entire drum or extend into upper canal wall, if necessary. Use aseptic gauze drainage and outside pad for absorption. Patients should never be allowed to suffer for more than forty-eight hours and remain exposed to the risks of complication.

28. **Incision of the Membrani Tympani.**—Packard emphasizes the great value of early incision of the membrana tympani in the treatment of acute suppurative otitis media, and the many advantages possessed by the so-called dry treatment, and by practicing efficient gauze drainage. Douching out the ear is distinctly contraindicated, except when it is done by a skilled aurist, who can properly dry the ear after such procedures.

29. **Acute Gonorrhea.**—Weiss continues his discussion of this subject; the various silver compounds, their advantages and disadvantages, are considered at length. The treatment of the mucosa should at all times conform to the microscopic findings.

30-33. **Tuberculosis.**—These four articles are an epitome of what is known of the questions dealt with in the papers, and serve to emphasize the importance of an early diagnosis, the necessity of careful differentiation between pulmonary tuberculosis and conditions resembling it, and the value of taking complete histories of each case.

Cincinnati Lancet-Clinic.

September 17.

34 Physiologic Therapeutics vs. Drugs in the Treatment of Diseases of Infancy and Childhood. J. Morton Howell.
35 Hypodermoclysis. Charles T. Souther.
36 Paraffin Injections for Overcoming Wrinkles and Minor Facial Imperfections. Charles C. Miller.

Annals of Surgery, Philadelphia.

September.

37 *Contribution to the Surgery of Neurofibroma of the Acoustic Nerve. Joseph Fraenkel, J. Ramsay Hunt, George Woolsey and Charles A. Elsberg.
38 *Adenoma of the Mucous Glands of the Lips as a Cause of Macrochellia. D. N. Eisendrath.
39 *Lingual Goiter. Henry R. Storrs.
40 Purulent Mastoiditis. J. A. C. Macewen.
41 Removal of a Foreign Body from the Bronchus with the Electromagnet. A. J. Hosmer.
42 Removal by Gastrotomy of a Hairpin Swallowed by a Twenty-months-old Child. A. P. Holden.
43 Details of the Technic of a Posterior Gastro-enterostomy. Charles L. Scudder.
44 Gangrene of the Hollow Viscera. V. Komerson.
45 Results in Abdominal-wall Suture. Charles Davison.
46 *A Posterior Excision in Certain Appendicitis Operations. John G. Sheldon.
47 Inflamed Appendix in the Sac of the Femoral Hernia. A. R. Shands.
48 Radical Operation for Malignant Neoplasm of the Urinary Bladder. A. A. Berg.
49 *Repair of the Urethra by Transplantation of the Urethra of Animals. J. H. Pringle.
50 The Formation of an Artificial Vagina by Intestinal Transplantation. J. F. Baldwin.
51 The Use of Electricity in Skin Grafting. J. D. Rushmore.

37. **Neurofibroma of the Acoustic Nerve.**—Fraenkel and Hunt are of the opinion that the symptoms of tumor of the acoustic nerve are so well defined that a diagnosis can be made with practical certainty in every case; not only with reference to its location, but also its nature and comparative size. However, other slowly growing pathologic conditions in the posterior fossa might closely simulate this condition. The slow and essentially benign nature of the growth, its non-infiltrating character and enucleability all favor surgical interference.

But its deep situation at the base of the brain, in immediate proximity to vital centers offers very serious obstacles. From personal observation the authors conclude that the surgical technic should be perfected along the following lines: 1. The avoidance of undue concussion in the removal of the bone and the enlargement of the trephine opening. 2. A method of extirpation by which the tumor could be extirpated without undue manipulation of the surrounding parts. 3. The division of the operation into stages, as recommended by Horsley, and celerity of execution.

38. **Macrocheilia.**—Eisendrath adds a second case to the literature of macrocheilia due to adenoma of the mucous glands of the lid, the diagnosis having been confirmed by a microscopic examination. The case improved remarkably after operation, and there has been no recurrence in a year.

39. **Lingual Goiter.**—Storrs reports a case of lingual goiter, the tissue involved being accessory thyroids at the base of the tongue which are embryonic remnants of the atrophied thyroglossal duct. Only 32 cases of this kind are recorded in the literature, 29 in women and 3 in men. These lingual tumors usually are situated on the dorsum of the tongue, generally just behind and below the foramen cecum, but sometimes enclosing it in their growth on the median line, as a rule, but perhaps a little to the right or left. In shape they are round or ovoid, their size ranging from that of a cherry to that of a man's fist. The tumor is encapsulated and may project about the surface of the tongue or be almost buried in the muscles of this organ. There is no inflammation or infiltration of the surrounding tissues, and at operation the tumor is enucleated easily. Its surface is covered with the mucous membrane of the tongue; it is smooth and shiny, and in color is darker than that of the surrounding mucous membrane, due to the great infiltration of blood vessels. These vessels cover the surface of the goiter and penetrate deeply into its tissue, and cause the profuse hemorrhages which occur at operation. This rich vascularization is of great value in differential diagnosis. The tumor may or may not be movable; its consistency is variable. The troubles caused by it are purely functional, and these vary with the size of the tumor. With one exception, the patients were in the best of health. It has all the characteristics of a benign tumor. The prognosis is favorable. The only rational method of treatment is removal, either by the use of the galvano-cautery loop, or by incision with enucleation. The latter operation is preferable and is performed easily. The tumor may be reached either through the buccal cavity or through an incision in the suprahyoid region, which may be simple or include the hyoid bone or inferior maxilla.

46. **Posterior Incision for Appendicitis.**—Sheldon describes a method by which the appendix is reached through Petit's triangle. The patient is placed on the left side and a large support put under the left loin, thus bringing the appendix nearer the incision by depressing the right side of the pelvis. An incision is made from a point one-half an inch behind the highest point of the crest of the ileum toward the tip of the twelfth rib. The length of the incision depends on the obesity and the body form of the patient. The anterior border of the latissimus dorsi muscle is located, freed by blunt dissecting and retracted posteriorly. This exposes the outer border of the quadratus lumborum muscle, the lumbar fascia, and the aponeurosis of the transversalis. A transverse incision, one-half to one inch above the crest of the ileum, is made, beginning at the outer border of the quadratus lumborum and extending forward parallel to the fibers of the transversalis, as far as is necessary to secure sufficient room to operate quickly. The subperitoneal fat is pushed aside with the finger, covered with a piece of gauze. The peritoneum is opened near the forward part of the incision and the peritoneal incision enlarged in a posterior direction. On opening the peritoneum the cecum presents itself in the wound. The appendix is amputated in the usual manner and when drainage is not necessary the wound is sutured in layers, with catgut and silkworm gut. Sheldon has never found it necessary to ligate a vessel during the operation, and seldom has it been necessary to check temporary bleeding with hemostats. In clean cases the operation has no advantages over the method ordinarily employed, except that it is followed by less shock and abdominal distress than is a laparotomy through an anterior incision. In obese cases the operation is more rapid and is less likely to be followed by hernia. In all cases requiring drainage the operation is preferable to the old method. The abscess is opened in the most dependent part and the infected area can be treated without coming in contact with the omentum or small intestines. Retroperitoneal infection is drained much more efficiently than is possible through an anterior incision. Sheldon has operated on 58 cases by this method and has found no disadvantages.

49. **Urethral Transplantation.**—Pringle describes three cases in which defects of the urethra have been treated by grafting portions of the urethra of an ox. Two of the patients so treated had sustained a complete and extensive rupture of the urethra in the perineum; the third patient had a hypospadias, there being a deficiency of the floor of the urethra for the whole of the penile portion of the channel. The operation in each case was a success, the grafted tissue remaining alive and furnishing a patent channel. In two of the patients the procedure had to be repeated, but in each of them, at the time of the second operation, the tissue which had been grafted on the former occasion was found to be present.

Post-Graduate, New York.

September.

52 Primipara in Obstetric Practice. F. A. Dorman.
53 Recent Advances in Genito-urinary Surgery. James Pedersen.
54 *Acute Rheumatism in Children. H. B. Sheffield.
55 *Tumors. R. Langerhans.
56 Communicability of Pneumonia by Contact. L. Weber.

54. **Acute Rheumatism in Children.**—Sheffield considers rheumatism in children a grave infection, one that requires active treatment particularly, in order to prevent serious complications. Rest in bed is the most important therapeutic measure in this direction, and should be enjoined during the entire course of the disease. Dieting he considers to be nothing but a myth. During the febrile stage the diet should, of course, be limited to the ordinary "fever diet." In older children he uses the salicylates combined with small doses of pepsin or ingluvin. For younger children he prefers aspirin, or the salicylates obtained from the wintergreen plant, in doses of 5 grains, to be repeated every two hours the first day and every four hours the following days. For the relief of articular pain and swelling the joint should be wrapped in absorbent cotton wrung out of a warm saturated solution of bicarbonate of soda. The compress should be covered with oiled silk and a flannel bandage, and changed as soon as it becomes dry. After disappearance of the acute symptoms the stiffness and lameness generally yield to gentle massage with an ointment containing 1 dram each of oil of gaultheria and ichthyol in 1 ounce of lanolin. Later on it is advantageous to supplement the local treatment by gentle general massage. The iodids should not be lost sight of in protracted cases.

55. **Tumors.**—This is a translation of that portion of Langerhans' work on pathologic anatomy which describes lipoma, myxoma, chondroma, osteoma, psammoma, melanoma and glioma.

St. Louis Courier of Medicine.

September.

57 Some Useful Anatomical Landmarks as a Guide to the Operation for Opening the Mastoid Antrum. Selden Spencer.
58 *Infection—An Overlooked Disseminator. E. A. Babler.
59 *Scarlet Fever Treated with Antistreptococcic Serum. H. N. Chapman.
60 Two Unusual Ovarian Cysts. A. H. Meisenbach.

58. **Infection.**—Babler refers to an overlooked disseminator of infection—the garment that drags on the floor of the home, that collects the filth and disease of the pavement, the steps, the darkened passageway, the street, the alley, or wherever its wearer may chance to go—and asks that every practitioner consider this matter carefully and do what he can to remedy this evil.

59. **Antistreptococcic Serum in Scarlet Fever.**—Chapman reports a case of scarlet fever which yielded promptly to anti-

streptococcic serum. Within ten hours after injecting 10 c.c. the temperature dropped 4 degrees. The dose was repeated every twenty-four hours, and the temperature reached normal ten hours after the fourth injection. The only other treatment was hydrogen peroxid for a throat wash and benzoate of soda internally, tonics and calomel.

Bulletin of the Johns Hopkins Hospital, Baltimore.

September.

61 The Training of the Surgeon. Wm. S. Halst.d.
62 Notes Suggested by the Franklin-Heberden Pamphlet of 1759. Henry R. Cushing.
63 *Vesico-vaginal Fistulæ Following Hysterectomy for Carcinoma Cervicis Uteri, with Special Reference to Their Origin and Closure. John A. Sampson.
64 *The Piezometer, an Instrument for Measuring Resistances. Howard A. Kelly.
65 Dr. Richard Brooke, the First Scientific Observer in Maryland. Bernard C. Steiner.

63. Vesico-Vaginal Fistulæ Following Hysterectomy.—Sampson says that the anatomic relation between the cervix and bladder is such that the anterior extension of carcinoma cervicis uteri soon invades the bladder wall, as shown by vesico-vaginal fistulæ, which may occur in the advanced cases; accidental injuries to the bladder during hysterectomy for cancer; cystitis following these operations. The surgeon who attempts to separate a carcinomatous cervix which has become adherent to the bladder usually leaves cancer tissue behind and the disease returns; so injures the bladder wall that a vesico-vaginal fistula may form, which, if recognized and repaired at the time, is apt to fail to unite because the fistula is situated in a portion of the bladder wall whose outer coats have been torn and whose blood supply has been injured by the operation. If he does not produce a fistula the injured portion of the bladder may be unable to resist infection and a severe cystitis may result. Because of this, if the cervix is adherent to the bladder, the portion of bladder wall adherent should be excised in order that a wider excision of the primary growth may be made; that the injured bladder wall may be repaired properly, and that the bladder may be better able to resist infection. Post-operative vesico-vaginal fistulæ may occur from undiscovered accidental injuries to the bladder, or the failure to repair injuries recognized at the time of operation; from the intentional formation of such fistulæ at the time of the operation in order to relieve intra-vesical tension and give the bladder a rest, and also the formation of fistulæ after the operation, in order to minimize the dangers of post-operative cystitis. Frequently post-operative vesico-vaginal fistulæ close spontaneously. Apparently the early operative closure of such fistulæ, unless in healthy bladder tissue, is difficult and operative measures should not be undertaken until the tissue has had a chance to regain its natural blood supply—after about two months. The radical operations for cancer of the uterus diminish the sensibility of the vagina and bladder to pain, so that post-operative vesico-vaginal fistulæ may be closed without the use of a general or local anesthetic. The following principles should be employed in the closure of these and all vesico-vaginal fistulæ: 1, approximation without tension; 2, a broad area of denudation exposing healthy bladder tissue; 3, accurate approximation with inversion of the bladder mucosa; 4, tying the ligatures so as not to strangulate the tissue. very fine silver wire, fastened by means of perforated shot, forms a very satisfactory suture material, and if a small piece of rubber tubing is placed between the shot and the vaginal mucosa, a most efficient "splinting" suture is formed, which, through the elasticity of the rubber tubing, maintains accurate approximation without strangulation.

64. The Piezometer.—Kelly designed this instrument for the purpose of aiding in outlining an abdominal tumor, and to estimate the degree of rigidity in the right iliac fossa in a doubtful appendicitis by comparing the rigidity of the right and left oblique muscles. The instrument may also be used as an algesimeter to determine how much pressure is necessary to elicit tenderness over the appendix. It should also have a field of value in teaching physical diagnosis, since it is far more delicate than the untrained sense of touch, and varying degrees of resistance can be demonstrated by means of it. The instrument is intended not to replace palpation, but to supplement or confirm the results obtained by it.

Kansas City Medical Index-Lancet.

September.

66 *Seasickness. Richard J. Tivnen.
67 *Chronic Bright's Disease. T. N. Bogart.
68 Yohimbin. J. W. Sherer.
69 Treatment of Pneumonia. Calvin Atkins.
70 Etiology and Treatment of Nervous States. O. L. McKillip.

66. Seasickness.—Tivnen reviews the treatment of seasickness and concludes that while little may be expected from any particular treatment, further travel may confer a certain amount of immunity.

67. Chronic Bright's Disease.—Bogart discusses this subject, and, in connection with other treatment, advocates the free use of diuretic and laxative waters.

Northwestern Lancet, Minneapolis.

September 1.

71 *Therapeutic Facts and Principles. Christian Johnson.
72 *Scientific Methods in Medical Education. R. O. Beard.
73 Prognosis and Treatment of Chronic Myocarditis. J. W. Bell.

71. Therapeutic Facts and Principles.—Johnson advances the following outline for a rational system of therapeutics: 1, the self-preservative power of living organisms; 2, medicine is to assist nature, to correct aberrant function; 3, the selective affinity of drugs for the different tissues; 4, biologic chemistry; 5, physics and therapeutics; 6, psychologic forces in therapeutics.

72. Medical Education.—Beard discusses higher standards of preliminary fitness, the combined scientific and medical course, the concentration system, the practical value of clinics and the specialties in medicine.

Annals of Otology, Rhinology and Laryngology, St. Louis.

June.

74 A Study of the Development of the Nose and Its Accessory Cavities. J. M. Ingersoll.
75 *Final History of a Supposed Case of "Vocal Nodule"—Epithelioma of the Larynx. Charles H. Knight.
76 *Malignant Growths at the Base of the Tongue. Richard H. Johnston.
77 *Nasal Hydrorrhea. John Edwin Rhodes.
78 The Pathologic and Pathologico-anatomic Investigation of the Diseased Middle Ear During the Last Decade, and the Change in Our Views of Its Therapy Caused Thereby. J. Grunert.
79 Chronic Non-specific Laryngitis: Clinical Forms; Treatment. Albert Ruault.

75. "Vocal Nodules."—Knight reports the outcome of a case of epithelioma of the larynx which he reported several years ago as one of "vocal nodules." Later a thyrotomy was done, the patient succumbing a few hours after the operation. This case emphasized the following points: 1. A stimulation to activity of malignant disease by endolaryngeal manipulations. We should always be prepared for this event, and, if possible, have the full consent of the patient to resort to whatever further operative procedures may seem advisable. 2. The testimony of the microscope is not to be depended on unless the whole thickness of suspected tissue at several points can be secured. It is seldom possible to obtain a satisfactory microscopic specimen by means of forceps passed through the mouth. 3. The question of transformation of a benign growth into one of malignant character has apparently been decided in the negative by statistics, yet in the case reported the appearance and history of the lesion continued absolutely benign for more than two years. In many cases a longer period of quiescence has been observed. There was nothing whatever in the course of the disease that justified a suspicion of malignancy until after the use of the snare. It is not supposed that the latter did more than excite the virulence of the morbid process. 4. We are still in the dark as to positive signs by which to identify malignancy at its inception. At present the only way in some cases in which to determine the character of a doubtful laryngeal lesion is by its complete exposure to an external wound. The picture in the laryngeal mirror is often indecisive as to the character of the lesion and misleading as to its extent. Although the prognosis in intrinsic cancer of the larynx is more favorable than that of malignant disease in almost

V 4
190

any other region of the body yet our guiding principle here as elsewhere should be early operation to include by a wide margin every vestige of morbid tissue.

76. **Malignant Growths of the Tongue.**—Johnston reports a case of sarcoma of the tongue and another of epithelioma, both tumors appearing at the base of the organ.

77. **Nasal Hydrorrhea.**—Rhodes reports a case, the patient being a woman aged 44, in which the following plan of treatment was pursued: She was given a pill containing zinc phosphid, nux vomica and quinin for her constitutional condition. Locally he used at first a 5 per cent. protargol solution, then 50 per cent. argyrol, and a spray of adrenals, 1 to 5,000, and Dobell's solution to use at home. He tried in succession cocain, adrenalin, cauterization, zinc salts, strong applications of menthol in albolene, and internally belladonna, aconite, etc., without the slightest benefit. Finally he used a solution of argentum nitrate in small quantities, 60 gr. to the ounce, and over a portion only of the nasal cavity. This caused some pain and a little headache, but immediately following there was a cessation of the dripping for a few moments. This treatment was continued until finally the discharge ceased entirely and has not returned.

Annals of Gynecology and Pediatry, Boston.

August.

80 *Uterine Hemorrhages and Their Cause. Thomas S. Cullen.
81 Recent Developments in European Gynecology. W. W. Chipman.
82 Cholera Infantum. R. M. Sterrett.

80. **Uterine Hemorrhages.**—Cullen groups the various causes of uterine hemorrhages in such a manner that they can be easily understood, but offers nothing new.

American Journal of Obstetrics, New York.

September.

83 *The Ultimate Results of Induced Labor for Minor Degrees of Pelvic Contraction. Richard C. Norris.
84 The Introduction of the Clinical Teaching of Obstetrics in the United States. J. Whitridge Williams.
85 A Statistical Study of the Albuminuria of Pregnancy, Labor and the Puerperium. Herbert M. Little.
86 Chorio-epithelioma Malignum: Report of a Case in Good Health Fourteen Months After Operation. Wm. F. Metcalfe and H. E. Safford.
87 *Symphysiotomy in Persistent Mento-posterior (Face) Presentation. E. R. Montgomery.
88 *Post-operative Intestinal Paresis. Daniel H. Craig.
89 A Case of Epithelioma of the Vulva. A. P. Reed.
90 *Bathing During the Menstrual Period. J. Clifton Edgar.
91 A Study of Intestinal Perforation and Peritonitis in Typhoid Fever, with a Report of Three Successful Operations and a Statistical Investigation of 295 Operative Cases. Wm. D. Haggard.
92 *Primary Repair of Lacerations of the Cervix Uteri. Edward P. Davis.
93 Adenomatous Hyperplasia of the Cervical Lymph Appendage of Gaertner's Duct. Richard R. Smith.
94 Some Remarks on Pus Collections in the Female Pelvic Cavity and Their Treatment. A. P. Stoner.

83. **Results of Induced Labor.**—Norris says that the excellent results for mother and child following the elective cesarean section for pelvic deformity have induced many operators to unnecessarily perform that operation for the lesser degree of pelvic contraction. He exploits the usefulness of inducing labor in the lesser degrees of contraction in order to give Nature the little assistance she may need to save the children that without this aid are frequently lost after version or a difficult forceps extraction at term. When the patient is first seen, too late to induce labor at the most suitable time, it is his practice never to allow such a case to go to, or beyond, full term, but to terminate the pregnancy at once and deliver the case as may seem best after the test of labor. An operative delivery, version or forceps after the induction of premature labor adds a distinct risk to the child, and, when possible, should be avoided. After true labor pains have begun and the cervix has dilated, it is an advantage to place the patient in the combined Trendelenburg-Walcher position. This is an important practical point to be remembered not only for induced labors, but for minor degrees of pelvic contraction when first encountered at term. The method of dilation used by Norris is the proper introduction of a bougie, followed by partial dilation of the cervix, if required, and then by the insertion of the largest size Vorhees' bag, on the stem of which more or less continuous traction is made by means of a cord and weight, if necessary, to awaken pains and aid in the dilation of the cervix. The time required to obtain sufficient dilation to accomplish spontaneous or artificial delivery varies from six and a half to fifty-three hours, the average being twenty-nine and one-quarter hours. In 30 cases of induced labor for the lesser degrees of pelvic contraction there was neither maternal mortality nor morbidity. Seven infants died; 2 were still-born, 1 from craniotomy after eversion and occiput rotating backward with the chin impacted above the symphysis. The other still-born infant was the result of a prolapsed cord, pulseless when the accident was discovered, and after delivery disclosed a large spina bifida incompatible with life. Two infants died from prematurity, the result of too early interruption of pregnancy. One infant died on the fifteenth day from infection of the navel; one on the third day from a sudden and rapidly fatal intraperitoneal hemorrhage, and one on the fifth day from aspiration pneumonia.

87.—See abstract in The Journal, xlii, p. 1511.

88. **Post-Operative Intestinal Paresis.**—Several months ago Craig published an article on the use of eserin salicylate in preventing intestinal paresis by inhibiting the inhibitory impulses ordinarily sent to the intestinal musculature by way of the splanchnics as a reflex result of peripheral iritation. Also that, through its powerful stimulant action, either directly on the muscular fibers of the intestine or the nerve terminations therein, the intestinal nerve plexuses are saved a vast amount of work, reaching in cases of actual paresis complete exhaustion. Further observation has shown Craig that under the use of eserin the post-operative conduct of the intestines is the same as though the abdomen had not been opened. In emergency operations following the use of eserin any marked accumulation of fecal matter not removed previous to operation is promptly expelled after operation. In many cases the bowels move freely and easily in from twelve to forty-eight hours after the return of the patient to her bed. When the bowels have been adequately prepared, an absence of movement during the same period is abundant testimony to the thoroughness of the preparation. During this interval both nurses and surgeon should be eternally vigilant and watch for signs and symptoms of intestinal paresis or adynamic ileus, because eserin may occasionally fail to manifest the expected therapeutic action, or sepsis may supervene and no method of treatment can wholly overcome the results of accidental infection nor of unclean, careless or slovenly technic; or obstruction may supervene, which is mechanical and not merely paretic. Eserin salicylate should never be kept in solution because of its deterioration. On the evening of the day succeeding operation Craig administers a tablet containing aloin, gr. 1/3; extract belladonna, gr. ¼; strychnin sulphate, gr. 1/60; eserin salicylate, gr. 1/100, the same dose to be given each night. He emphasizes the importance of becoming thoroughly familiar with the physiologic action of eserin and its source so as to avoid untoward effects.

90.—See abstract in The Journal, xlii, p. 1585.

92.—Ibid., p. 1584.

Journal of the Michigan State Medical Society, Detroit.

September.

95 Appendicitis (Summary). A. J. Ochsner.
96 Vascular Disease as a Factor in the Etiology of Epilepsy. Wm. J. Herdman.
97 Advantages of Early Operation in Hip Joint Disease. E. C. Taylor.
98 The Prevention of Drug Habits. W. J. Wilson, Jr.
99 Gastroptosis—Dilatation and Prolapse of the Stomach. W. E. Newmark.
100 Laryngeal Complications of Typhoid Fever. W. L. Wilson.

California State Journal of Medicine, San Francisco.

September.

101 The Rôle of the General Practitioner in the Prevention of Consumption. F. M. Pottenger.
102 Observations on Sanatoria for Pulmonary Tuberculosis. John C. King.
103 Healed and Quiescent Pulmonary Tuberculosis; an Analysis of 500 Cases, with Remarks on Pleural Tubercles. George Blumer and August J. Lartigau.
104 The Advantage of Mules' Operation Over Simple Enucleation. Redmond Payne.

105 Operative Fistulæ of the Male Urethra. R. L. Rigdon.
106 The Symptoms of Glaucoma. Albert B. McKee.

Pennsylvania Medical Journal, Pittsburg.

August.

107 *One Year's Work in Appendicitis. John B. Deaver.
108 Differences in the Management of Appendicitis and Salpingitis. George E. Shoemaker.
109 The Management of the Pus Appendix. George W. Guthrie.
110 Value of Differential and Absolute Leucocyte Count in Cases Simulating Appendicitis. A. Barr Snively.
111 Left-sided Appendicitis. Edmund W. Holmes.
112 Treatment of Suppurative Appendicitis. Ernest Laplace.
113 Clinical Course and Diagnosis of Arteriosclerosis. Alfred Stengel.
114 Laryngeal Tuberculosis. Ross H. Skillern.
115 Diphtheria Antitoxin Employed in the Treatment of Scarlet Fever. C. D. Miller.
116 Simultaneous Subcoracoid Dislocation of Both Shoulders. A. Stewart.

107.—See abstract in THE JOURNAL, xli, p. 1105.

Toledo Medical and Surgical Reporter.

September.

117 Early Diagnosis and Treatment of Diphtheria. W. D. Stewart.
118 Intestinal Parasites in Children. C. E. Monroe.
119 What Should the General Practitioner Know About the Ear? W. H. Snyder.
120 Croup. William F. Waugh.

International Journal of Surgery, New York.

September.

121 Suprapubic Enucleation of the Prostate. H. O. Walker.
122 The Treatment of Puerperal Infection. J. T. Altman.
123 Sepsis. Its Clinical Aspect and Treatment. (Continued.) J. Bennett Morrison.

Maryland Medical Journal, Baltimore.

September.

124 Remarks on the Etiology and Treatment of Diabetes Mellitus. (To be continued.) Thomas B. Futcher.
125 Antitoxin for Hay Fever and Rose Cold. Leonard K. Hirshberg.

Albany Medical Annals.

September.

126 Is Nursing a Profession? Henry M. Hurd.
127 Acute Purulent Otitis Media. Some Suggestions as to Its Therapeutic Management and the Prevention of Its Complications. Frederick T. Clark.
128 Associated Cases of Staphylococcus Pyogenes Aureus Infection. George E. Beilby.

Brooklyn Medical Journal.

September.

129 Factors in the Destruction of Primitive Man. Frederick A. Cook.
130 Historical Résumé of Clinical Teaching. William Schroeder.
131 Benzoyl-acetyl peroxid in the Treatment of Typhoid Fever. W. W. Ross.

Medical Review of Reviews, New York.

August 25.

132 Aphasia and Agraphia. Edward D. Fisher.

Illinois Medical Journal, Springfield.

September.

133 The Diagnosis of Pulmonary Tuberculosis. Frank Billings.
134 The Duty of the State in Restricting Tuberculosis. Harold N. Moyer.
135 The Treatment of Pulmonary Tuberculosis. Robert B. Preble.
136 The Annual Economic Loss to Illinois from Tuberculosis. Homer M. Thomas.
137 Mortality from Tuberculosis in Illinois for the Years 1902 and 1903. George W. Webster.
138 Factors Causing Consumption and Furthering Its Spread—Suggestions for Its Prevention. Charles L. Mix.
139 *Leukemia; with the Consideration of Its Treatment by the Roentgen Ray. Everett J. Brown.
140 The Subcutaneous Injection of Paraffin, More Particularly for the Correction of Nasal Deformities. James T. Campbell.
141 *Symphysiotomy in Persistent Mento-posterior Face Presentations; with Report of a Case. E. B. Montgomery.
142 Report of Three Cases of Penetrating Wounds of the Chest, Involving the Diaphragm and Abdominal Viscera. Daniel H. Williams.
143 *The Pneumonia Problem. Arnold C. Klebs.

139.—This article has appeared elsewhere. See THE JOURNAL of July 23, ¶60, p. 284.

141.—See abstract in THE JOURNAL, xlii, p. 1511.

143.—Ibid., p. 1441.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

The Lancet, London.

September 10.

1 Address on the Anatomy of Study. Alexander MacPhail.
2 *Human Piroplasmosis. C. Donovan.
3 *Epibulbar Melanotic Sarcoma. J. Gray Clegg and I. Walker Hall.
4 Treatment of Ruptured Urethra by Combined Drainage (Suprapubic and per Urethram). Henry Rutherfurd.
5 *Case of Pseudo-leukemia (Lymphosarcoma) in a Young Child. John J. Redfern and Wm. Hunter.
6 Tender Spots on the Spine in Relation to Pain in Various Parts of the Body. St. Clair B. Shadwell.
7 Rupture of the Uterus During Labor; Laparotomy; Recovery of Mother and Child. Edgar Down.
8 Case of Tumor of the Centrum Ovale with Cerebellar Symptoms; Difficulties of Diagnosis. W. L. Ascherson.
9 *Treatment of Rectal Prolapse by the Submucous Injection of Paraffin. Arthur H. Burgess.
10 Cases of Appendicitis with Perforating Duodenal and Gastric Ulcer. H. A. Lediard.
11 The Evolution of Man's Diet. Harry Campbell.

2. **Human Piroplasmosis.**—Donovan gives a full description of the maladies as observed by him, the causative animal parasite and the postmortem findings. He is convinced of the identity of this disease and kala-azar, the exciting cause in both being the same.

3. **Epibulbar Melanotic Sarcoma.**—Clegg and Hall add two cases of pigmented epibulbar tumors situated at the limbus to the literature on this subject. Of 520,523 out-patients who have attended at the Manchester Royal Eye Hospital during the last thirty-three years, only 3 were cases of pure melanotic sarcoma of the limbus, although general "orbital melanosis" has been noted more frequently. One case disappeared after operation; the other 2 recovered completely. In 1 case the eye was removed, in the other 2 the tumor was excised. Of the latter the one patient remaining under observation regained perfect vision, and is in robust health.

5. **Pseudoleukemia in a Child.**—Redfern reports a case of pseudoleukemia occurring in a child two years and nine months old, with no history of previous illness. The case terminated fatally by syncope after about eight weeks' illness. Only the cervical glands were enlarged, but they were not painful or tender on pressure. The axillary and anterior mediastinal glands became enlarged later. Dyspnea was marked. There was unilateral perspiration on the left side of the body, face and limbs. The left pupil was more dilated than the right. The general nutrition was maintained until death. There was no family history of syphilis or tuberculosis. The blood condition was as follows: Red corpuscles, 4,080,000; leucocytes, 8,000; lymphocytes, 30 per cent.; hyalin leucocytes, 10 per cent:; polymorphonuclear cells, 68 per cent.; eosinophile cells, 2 per cent.

9. **Injection of Paraffin in Rectal Prolapse.**—Burgess has treated 18 cases of rectal prolapse by the submucous injection of paraffin having a melting point of 111. Of the 18 cases the ages ranged from 3 to 48 years, and the size of the prolapse from 1½ to 5 inches in length. In all of them the prolapse descended with almost every bowel movement, and remained down until replaced. Two were associated with excoriation and ulceration of the mucous membrane; 2 had been previously treated by linear cauterization without success, and 2 had recurred after the excision of the lower part of the rectum. The injection treatment has been extremely satisfactory in all the cases, not a single instance of recurrence having occurred. Paraffin masses can readily be distinguished after two months, feeling like nodules of cartilage. The technic of the operation is as follows: The paraffin is kept melted by placing the container in water at a temperature of about 120. The syringe has its barrel covered with rubber to retain the heat longer. The instrument is placed in the hot water bath for a few minutes, is then filled with melted paraffin, and replaced in the bath until the moment it is required to be used. The patient is anesthetized and placed in a lithotomy position; the prolapse is drawn out to the fullest possible extent. The apex of the prolapse is seized with artery forceps, at three points equi-distant along its circumference, so selected that two forceps will be placed anteriorly and the third in the posterior median line. By gentle traction the mucous membrane is raised into three ridges forming an equilateral triangle. The needle of the syringe is inserted in turn into the middle of each side of this triangle, from 2 to 3 c.c. of paraffin being introduced on each occasion. As this solidifies, the mucous membrane bulges inward, converting the lumen of the

bowel into a more or less tri-radiate slit. The forceps are removed, the apex of the prolapse is reduced, and the mucous membrane is again seized with forceps about 1½ in. from the original apex, as before, except that at this time, two are placed posteriorly, and one anteriorly. The paraffin is injected as before, with the result that the lumen of the bowel is again converted into a tri-radiate slit, the radii, however, corresponding to the intervals between the radii of the tier above. This portion of the prolapse is now reduced and the forceps re-applied, as at the first time, and the process is repeated until the anus is reached. As a rule, three tiers are sufficient, but in a very long prolapse four may be introduced safely. In order that straining may not cause the prolapse to re-descend before the paraffin has firmly set, Burgess inserts a stout silkworm-gut suture through the buttocks on either side, tying it firmly over a pad of gauze placed over the anal orifice. This suture is removed at the end of twenty-four hours. No special after-treatment is required. The patient is kept in bed for four or five days. The bowels have usually been allowed to act spontaneously. Autopsy shows that the paraffin remains strictly localized to the area of its introduction and undergoes no change. However, the masses become encapsulated by fibrous tissue. The rectum is fixed firmly in its normal situation, and can not be drawn down to constitute a prolapse, even after considerable pressure.

British Medical Journal, London.

September 10.

12 Discussion on Immunity. J. Ritchie, R. Muir, H. Noguchi, A. Ruffer, A. E. Wright and others.
13 Discussion on the Rôle of the Lymphocyte. G. L. Gulland, J. M. Beattie, W. G. MacCallum, T. Houston and others.

Journal of Tropical Medicine, London.

September 1.

14 *Onyalai: a Disease of Central Africa. A. Yale Massey.
15 *Antityphoid or Anti enteric Inoculation. F. Smith.

14. **Onyalia.**—Under this name Massey describes a disease found among the blacks of Portuguese West Africa. It is rarely ever fatal. The only clinical evidence is the appearance on the hard palate and buccal mucous membranes of vesicles distended with blood, ranging from one-quarter to half an inch in diameter. Sometimes these vessels are umbilicated; they can not be emptied easily; they have a tendency to appear in clots. There is no fever, the patient complaining only of discomfort in the mouth and a general feeling of lassitude. The duration of the disease is about ten days. Treatment consisted of the administration of 60 grains of bicarbonate of soda and half an ounce of unpurified codliver oil internally each day. Calcium chlorid was not given a trial.

15. **Antityphoid Inoculation.**—Smith has made a careful study of this question and summarizes his paper as follows:

1. Antityphoid inoculation has a distinct value in protecting the human organism from attacks of typhoid fever.
2. To obtain the fullest measure of protection the operation should be done, say two months before exposure to infection.
3. Even when inoculation is performed shortly before exposure to infection it is a beneficial procedure on the whole.
4. The protective influence is exerted for some years, long enough probably to tide over the most vulnerable age of youth and earlier manhood.
5. The protection afforded is in the proportion of 3 to 1.
6. The proportion of protection is much less than that of efficient vaccination for smallpox.
7. Vaccination against smallpox is about ten times as effective as antityphoid inoculation.
8. Typhoid under normal conditions at home and in some foreign stations is not a very common disease, such as smallpox used to be.
9. Typhoid among soldiers—on active service in most places, and when on peace service abroad, especially in India, South Africa, Egypt, Bermuda, Mauritius and Malta—is a very common and fatal disorder.
10. Typhoid is a danger to which nurses and hospital subordinates generally are specially exposed.

The final conclusions reached as regards the practical value of antityphoid inoculation are:

1. It is not at present of sufficient practical value to warrant its general adoption by the nation at large.
2. It is of distinct practical value to any community in which typhoid breaks out in an epidemic form.
3. It is of practical value to those who have much to do with typhoid patients.
4. It is of utility for general adoption among newcomers in certain special endemic areas abroad, such as some Indian stations and Malta.
5. It is of great practical value at all times to soldiers serving in India, South Africa and Malta; also, but in a less marked degree, in Gibraltar and other places.
6. It is certainly of the greatest practical value to soldiers about to take the field in any tropical or subtropical country where typhoid is known to prevail.

Medical Press and Circular, London.

August 31.

16 *Preventive Treatment of Scarlet Fever by Isolation (Aggregation) Hospitals. H. E. J. Biss.
17 Hospital Isolation and Scarlet Fever; the Statistical Aspect. C. K. Millard.

16. **Preventive Treatment of Scarlet Fever.**—Biss calls attention to the fact that isolation of the patient, except in the case of smallpox, has proven ineffectual so far as stamping out scarlet fever is concerned. If scarlet fever is to stand a chance of eradication by isolation, a prodigious number of cases of slight sore throat, of anomalous blushes of the skin, of ill-defined shagginess of the fingers, must be isolated, or a large proportion of real sources of infection will be left unrestrained. This would entail imprisonment and serious loss to many not suffering from scarlet fever, but whose illness could not be diagnosed with certainty. Any system that seeks to eliminate the personal element in scarlet fever infection must rest for its success on the separation of all cases, or of such a large percentage that a very sensible reduction in the total number of infections would be apparent. Such can never be the case until the diagnosis has improved to such a point that practically all cases, however mild, are recognized and dealt with in hospital or at home. It is doubtful whether individual elimination is likely ever to be of much service as a prophylactic measure.

Dublin Medical Journal.

September 1.

18 On the Need for Family Care of Persons of Unsound Mind in Ireland. Conolly Norman.
19 Suggestions for the Prevention of Puerperal Infection in Private Practice. John W. Byers.
20 Some Remarks on the Epiphyses of the Long Bones and Their Bearings on the Operation of Resection. John Knott.
21 *Burning Foot, or Erythromelalgia Tropica. P. N. Gerrard.

21. **Erythromelalgia Tropica.**—Gerrard reports six cases of burning foot, or erythromelalgia, a disease of the plantar nervous or arterial supply, which occurs in the natives of the Malay peninsula who are accustomed to work barefooted on roads and plantations. It commences, usually, with a "pins and needles" sensation, affecting the soles of the feet. It then progresses to an acute burning sensation, which in the majority of cases is so severe as to prevent the patient walking, and frequently necessitates the administration of narcotics to produce sleep. In some cases the patient is enabled to walk on the heels with the aid of a stick, while in others no progress nor attempt can be made. Although a previous history of malaria can usually be obtained, no history of malaria occurring during the progress of the disease has been found in any case. It is possible, therefore, that the disease may be a neuritis of malarial origin in which the blood supply to the nerves implicated may have become cut off by means of a deposit of malarial pigment. Another etiologic factor to be considered is "arteriole fatigue." The treatment was varied. Some relief was obtained in two cases by immersing the feet in hot water containing a quantity of salt. Various liniments and ointments were unsuccessfully tried, and general tonics, with or without strychnin, also failed to give permanent relief. Narcotics and sedatives of all kinds only relieved the disease for the period of their action.

Presse Médicale, Paris.

22 (No. 69.) *Du principe phospho-organique des graines végétales: L'acide anhydro oxyméthylene-diphosphorique. Son action biologique. A. Gilbert and A. Lippmann.
23 Functional Impotence of Shoulder in Industrial Insurance. F. Mailly.—Impotences fonctionelles de l'articulation de l'épaule au point de vue des accidents du travail.
24 (No. 70.) *Chlorose et tuberculose. M. Labbé.
25 *Les hernies diaphragmatiques congénitales. Planchu.
26 Complications des extractions de dents (of teeth). G. Mabé.

22. **Organic Phosphorus in Therapeutics.**—Phosphorus is needed by the organism, not only for its nutritive but also for its dynamic properties, Gilbert remarks. Recent research has shown the constant absence of mineral phosphates from human milk, and has also shown the remarkable abundance of phospho-

organic compounds in the soft parts of the organism. Aside from the skeleton—in which they serve a purely mechanical purpose—the mineral phosphates are found in the organism only in the excreta, where they mainly represent the detritus left from the destruction of the organic compounds of phosphorus. The use of mineral phosphates in therapeutics is irrational. The organic phosphates, on the other hand, offer a promising field for therapeutics. Among these organic phosphates, the phospho-organic reserve found by Posternak in all chlorophyll plants seems best adapted for the purpose. It is found in all the vegetables and cereals, and contains a large percentage of organic phosphorus. He called it anhydro-oxymethylene-diphosphoric acid, and has isolated it and combined it to form a neutral sodium salt and an acid calcium salt. The acid is extracted from grains and contains nearly 22 per cent. of phosphorus in an organic combination. In the clinic it is proving the most rapid, the most effectual and the most constant in its action of any phosphorus medication known by the writers to date.

24. **Chlorosis and Tuberculosis.**—Labbé regards chlorosis as merely a symptom of some other affection, usually tuberculosis, nephritis, syphilis or some gastric lesion. When no other cause can be determined, it is almost invariably the first manifestation of latent tuberculosis, as he shows by a number of typical examples. He regards the existence of chlorosis at puberty as testimony in favor of tuberculosis later, as much so as a history of pleurisy. The chlorosis can be cured the same as the pleurisy, and the tuberculosis may be averted, but its tuberculous nature is not contradicted by the patient's recovery. The recovery depends on the care with which the chlorosis or pleurisy is treated. If the subjects can have the benefit of country air and hygienic surroundings, the chances are in favor of a return to health. These chlorotic subjects with a suspicion of tuberculosis are the ones that will be benefited most by sanatorium treatment. They should remain in the sanatorium until the blood is completely restored to normal.

25. **Congenital Diaphragmatic Hernia.**—Plauchu describes 2 cases, and mentions that 258 have been published. In his cases the necropsy showed that the hernia was absolutely incompatible with life.

Berliner klinische Wochenschrift.

27 (XLI, No. 35.) Myasthenia pseudoparalytica (Erbsche Krankheit) mit Zungen-Atrophie nach Ueberanstrengung (after overexertion). P. K. Pel (Amsterdam).
28 Eigenartiger Symptom-Complex nach Schläfenschuss (bullet in temple). Kölpin (Westphal's clinic, Greifswald).
29 *Enuresis der Kinder (in children). J. G. Rey (Aix).
30 *Filtering Paper in Hematology. T. W. Tallqvist (Helsingfors).—Ueber die Anwendung des Filtrirpaplers im Dienst der praktischen Hematologie.
31 *Kosmetische Massage. J. Zabludowsky (director of official University Massage Institute, Berlin).

29. **Enuresis in Children.**—Rey has been studying 52 cases of enuresis in children. He found that chemical analysis almost invariably demonstrated that the urine of such children was abnormally irritating or that there was some lesion in the urinary apparatus. In 19 of the 52 cases examined he found the urine turbid from enormous quantities of colon bacilli present. They were in bunches like granules floating in the opalescent urine. Such urine has generally an acid reaction and smells stale. Prolonged treatment of the entire uropoeitic system was required to cure these cases of bacteriuria. Long continued use of salol, with a strict milk diet and regularity of meals, proves more successful than irrigation of the bladder. In 2 cases of recurring hydronephrosis with high fever, in girls aged 16 and 3, the palpable tumor vanished as a large amount of turbid urine was evacuated, and the fever subsided. These conditions kept recurring until the bacteriuria was conquered or checked by long salol and urotropin medication. Internal treatment is alone able to reach and cure such cases. Latent cholecystitis is particularly frequent in girls, and is not seldom the cause of the pale, depressed and irritable condition of the children who suffer from enuresis. As such cholecystitis rarely induces marked bladder symptoms, it is generally overlooked. Twenty-four of his series of 52 bed-wetters belonged to the category of simple mucous cystitis due to general acid intoxication. The strongly ammoniacal urine irritates the bladder lining and induces a condition similar to that of "irritable bladder." Infants in this condition are liable to scream every time they urinate, and hold back all the urine they can. Frequently the trouble is ascribed to phimosis, but salol and dieting will in many instances cure it without an operation. In case a phimosis operation is undertaken, the irritating urine is liable to prevent healing or cause such complications that surgical intervention should be strictly contraindicated. In 3 other children there was pronounced phosphaturia, in another excessive uric acid output. The first were treated with milk diet and avoidance of vegetables, the latter by being put on a vegetable diet, all promptly recovering. In 3 other cases the enuresis was conquered by blunt detaching of the prepuce and removal of clumps of smegma in the corona glandis. The remaining 2 children in his series were affected with oxyuris. Some writers attribute the enuresis at night to fright in bad dreams, but Rey thinks that the bad dreams are probably the result of the impulse to urinate, or of emission of irritating urine. He thinks it is possible that the enuresis of early infancy, due to irritation of the bladder, may possibly survive its cause. These are the cases of sudden cure after faradization, epidural injection, etc. When the bladder irritation still persists, all such measures will be futile. Chemical and bacteriologic examinations should be made in every puzzling case of enuresis, and more attention should be paid to the catarrh of the bladder in infants, with cystoscopy of girl infants and older boys.

30. **The Filtering Paper in Practical Hematology.**—Tallqvist reviews the various points to be learned from his method of examining the blood taken up on filtering paper, comparing it with a standard scale. In case of leukemia, the aspect of the blood spot differs from all those in the scale. In sharp contrast, we see that the drop of blood is very slowly absorbed by the paper. Some time is required before it spreads enough for examination. The color of the spot is irregular. Nothing but an intense increase in the white corpuscles affects the behavior of the drop of blood in this way, evidently altering its physical characteristics.

31. **Cosmetic Massage.**—Two or three years ago the University of Berlin established a massage institute, in charge of Prof. J. Zabludowski. He is a frequent contributor to medical literature, as readers of these columns are aware. In this communication he discusses the subject of "beauty doctoring," as well as cosmetic massage in general. In the first place, he emphasizes the fact that rational cosmetics is synonymous to a large extent with individual hygiene. Also that cosmetic massage is far from meaning massage of the exposed parts of the body alone. Its sphere is restricted to restoring what is partially lost or warding off impending loss. Over-fat faces can be reduced, angular faces can be rounded, and recent morbid products or recently morbidly altered tissues will be found more responsive to massage than the normal elements of the organism or long-established morbid elements. But the massage should seldom be restricted to local manipulations alone, but should be extended over large areas. Nothing would be accomplished in case of a double chin, for example, if the massage were restricted to the chin. It is worked on both directly and indirectly by toning up the general system with massage and therapeutic active and passive movements. In the same way, the tendency to wrinkles is opposed by measures to improve the general nutrition, supplemented by kneading and stroking massage of the part. An emaciated part of a muscle in the brow, for instance, contracts readily when the inhibiting action of the missing subcutaneous fat tissue is lost. As soon as the nutrition of the muscle is improved by local and general massage, the muscle becomes thicker and does not contract so readily. The nerves in the part become more resistant and do not respond so easily to minimal irritations. The skin above becomes smooth and does not wrinkle so readily. Massage treatment, in his experience, has frequently abolished nervous twitchings and tics in the face. Another class of cases benefited is the climacteric congestions in the face. The circulation can be regulated by massage of large surfaces of the body. Still another class of patients benefited are those following

V 43
1904

a special diet with irritating restrictions. At times massage may be effectually substituted for the dietetic restrictions. Zabludowski describes his mode of massaging, using sometimes a vibrator or a vacuum pump, with a cup 3 to 5 cm. in diameter, applied for a minute or two. Both pump and vibrator are run by a motor like a dentist's drill. Digital self-massage is impracticable, as it is impossible for it to go deep enough, the hands tire soon, and so many parts are inaccessible. He recommends, however, a small apparatus for vibration massage which is worked by electricity or by turning a crank. Steaming the face is injurious, as it renders the skin sensitive to weather influences. If a salve or paste is not decidedly slippery it merely irritates the skin when massaged into it. Unless the skin is very dry or the hands very rough, the massage is best done without any medium, but if one is needed, the best lubricant is natural white vaselin (Virginia vaselina alba), made without evaporating all the water in it. It becomes unsuitable if left exposed to the air for a day or two, as the needed water dries out. He never massages more than 15 minutes at a time for the face, and 30 minutes for general massage. He aims to make it rapid, thorough and not disagreeable. The work is done with the hand and arm rather than with the fingers.

Centralblatt f. Chirurgie, Leipsic.

Last indexed page 763.

52 (XXXI, No. 33.) Gallstone Operations. W. Serenin (Moscow).—Einiges zu den Gallensteinoperationen.

53 (No. 34.) *Zur subkutanen Gestaltung der linearen Osteotomie. O. Heine (Dortmund).

54 Zur Arthrodesen-Bildung. O. Hagen-Torn (St. Petersburg).

55 (No. 35.) *Zur Technik der Transplantation nach Thiersch. C. Lauenstein (Hamburg).

56 Einige Bemerkungen zur Frage über die sogenannte congenitale Hüftgelenksverrenkung (hip joint dislocation). O. Hagen-Torn.

33. Subcutaneous Osteotomy.—Heine applies the principles of subcutaneous tenotomy to osteotomy. There are two or three ways of doing this, but the best is to pull the skin along so that the part normally over the bone is drawn away to a distance, and the incision is made through a part which subsides afterward to its proper place remote from the point of the cut into the bone. Such a technic is particularly advantageous for children, especially in operations on a rachitic leg. The part of the skin incised is that which lies normally over the tibialis anticus and the extensor tendons. The operation is much shorter; the incision need not be longer than the breadth of the chisel; air is excluded; the result of the operation resembles the conditions in an uncomplicated fracture, and the skin wound and the cut into the bone are far apart.

35. Improved Technic of Thiersch Grafting.—Lauenstein does not freshen the surface to be transplanted, but merely rubs it with a gauze pad until it becomes slightly bloody. He uses one pad to each area the size of the palm. The Thiersch flaps are then applied, and they heal in place much more rapidly than by the old method of freshening with the curette. The first case on which he tried this technic was an extensive defect on the arm, extending over the shoulder, the patient very much debilitated. The wound was dressed with Credé's silver gauze, and when the dressings were changed a week later the entire grafted material had healed faultlessly in place.

Centralblatt f. Gynäkologie, Leipsic.

Last indexed page 763.

37 (XXVIII, No. 32.) *Zur mikroskopischen Diagnose des Abortus. F. Hitschmann (Schauta's clinic, Vienna).

38 *Zur Frage der Tuben-Menstruation. W. Thorn.

39 Modificierte Kugelzange (ball forceps). O. Frankl (Vienna).

40 *Can Fatal Infections Be Avoided in Maternities Utilized for Teaching? F. Ahlfeld.—Lassen sich Infektionen mit tödlichem Ausgange in Entbindungsanstalten, die dem Lehrzwecke dienen, verhüten?

41 Ueber die Beteiligung des Endometriums an der gonorrhoischen Vulvo-Vaginitis der Kinder (in children). P. Jung.

42 Styptol bei Gebärmutterblutungen (uterine hemorrhages). K. Witthauer.

43 (No. 34.) Akute gelbe Leber-Atrophie im Puerperium (yellow atrophy of liver). R. Cohn.

44 Fall von vaginaler Sectio cesarea bei Eklampsie. G. W. Maly.

45 Bemerkungen zur Frage der Konvulsionen nephrektomierter Kaninchen (rabbits). R. Wolf.

46 Zur schnellen Erweiterung der Cervix (rapid dilation). V. Frommer.

47 (No. 35.) Korrektur von Deviationen des Uterus durch "verkürzende Plastik der Ligg. rotunda und Ligg. sacro-uterina per laparotomiam (fibro-fibröse, indirekte Fixierung). M. Sperling (Königsberg).

48 Automatic Double Retractor. K. Reifferscheid (Bonn).—Ein selbsttätiger Wundhaken.

37. Microscopic Diagnosis of Abortion.—Hitschmann describes a case in which the young ovum was found intact while the glands showed no evidence of the changes which some have asserted are characteristic of an abortion. In another case he found the characteristic glands, but there had been no pregnancy. He is inclined to regard these changes in the glands as liable to be induced by menstruation alone. He also believes that a membranous dysmenorrhea may cause changes in the connective tissue which simulate decidua cells. He cites a suggestive case in which a typical dysmenorrheic membrane was examined in a large series of sections, with finally the discovery of a minute ovum, not projecting above the surface, and surrounded by decidua cells only in its immediate vicinity.

38. Tubal Menstruation.—Thorn describes two cases of pathologic tubes in one of which hemorrhage from the tubes accompanied normal menstruation; in the other it substituted the latter.

40. Infection in Teaching Maternities.—Ahlfeld states that there have been 7,000 deliveries in the Marburg maternity in his charge, and that fully fifty thousand times have the students made examinations of the women before and during delivery, and yet only a single death has occurred from infection after a normal, spontaneous birth. In this one instance the examination had been done after thirty minutes' disinfection of the hands under skilled supervision. The circumstances suggested that the woman had infected herself with her own fingers, a possibility to which not enough attention has been paid hitherto. In his clinical experience of twenty-three years, with 7,000 deliveries and the training of 1,000 medical graduates and 2,000 midwives or obstetric nurses, he thinks he has not had a single case of fatal septic infection traceable to the use of the clinical material for teaching purposes. Self infection *in puerperio*, with fatal outcome, is extremely rare in well-conducted institutions, but self infection *in partu*, especially in case of a tedious, long-protracted birth, is of much more frequent occurrence and can scarcely be avoided.

Deutsche medicinische Wochenschrift, Berlin and Leipsic.

49 (XXX, No. 34.) *Zur ätiologischen Diagnose des Abdominal-Typhus. Jürgens (Berlin).

50 *Sweating for Relief of Kidneys. H. Strauss (Senator's clinic, Berlin).—Ueber Nierenentlastung durch Schwitzen.

51 Weitere Untersuchungen über Eiweissprazipitine (albumin precipitins). L. Michaelis (von Leyden's clinic, Berlin).

52 Zur Immunisierung gegen Tuberkulose. F. Neufeld (Infectious Institute, Berlin). (Supplement to article in No. 18.)

53 *Carbonic Oxid Poisoning. E. Knecht (Dresden).—Zur Kenntnis der Erkrankungen des Nerven-Systems nach Kohlenoxydvergiftung.

54 Ein neuer Infusions-Apparat. Ansinn (Demmin).

55 Die Akademie für practische Medicin in Cöln.

56 Tribute to Koch.—Ehrung Robert Kochs. See page 823.

57 (No. 35.) *Extraction of the Urates and Joint Capsule from a Gouty Toe. Riedel (Jena).—Die Entfernung der Urate und der Gelenkkapsel aus dem an Podagra erkrankten Grosszehgelenke.

58 2 Fälle von akuter Pankreatitis mit disseminierter Fett-Nekrose, geheilt nach Laparotomie. Wiesinger (Hamburg).

59 *Zur Frage der Spontan-Heilung des Krebses (Spontaneous cure of cancer). R. Borrmann.

60 Buttermilk Conserve. F. Gernsheim.—Einige Bemerkungen zu Koppes Erfahrungen mit einer Buttermilch-Konserve als Säuglingsnahrung.

61 Sigmoiditis acuta. Walcha.

62 *Typischer Fall von Menstruatio Praecox. A. Stein.

63 New Springless Truss. Wörner (Schwabisch Gmünd).—Ein neues Bruchband ohne Feder.

64 *Remedy for Mosquitoes. Schill.

65 *Madeira as a Health Resort. Wolff (Reiboldsgrün).

66 Reform in Pharmacy System. Klose.—Reform des Arzneiversorgungswesens.

67 Medicoiegal Decisions in Insurance Questions. Lass.—Die neuere Rechtsprechung des Reichs-Versicherungsamts auf dem Gebiete der sozialen Medizin. (First part in No. 13.)

68 *Ueber die von mir an Waldeck-Rousseau vorgenommene Operation. H. Kehr.

69 Early Reaction After Röntgen Exposure. A. Kohler.—Frühreaktion nach R.-Bestrahlung.

70 (No. 36.) *Ueber die Beck'sche Methode der Hypospadie-Operation. C. Böttlicher (Giessen).

71 *Rupture of Bladder During a Bottini Operation on the Prostate. P. Rosenstein.—Physikalische Versuche zur Erklärung einer bisher nicht gewürdigten Gefahr der Bottinischen Operation.

72 Zur Kasuistik des Morbus maculosus Werlhofii. O. Moritz.

73 Ueber infectiösen, ueberhaften Icterus (Morbus Weilii), im Kindesalter, zugleich ein Beitrag zur Pathogenese des Bacillus proteus fluorescens. H. Brüning (Leipsic). (Commenced in No. 35.)

74 Iron Light Treatment of Alopecia Areata. Supplement to article in No. 31.
75 Karl Weigert. Nekrolog.

49. **Etiologic Diagnosis of Typhoid Fever.**—Jürgens comments on the facts that healthy persons can shelter the typhoid bacillus, and that typhoid bacilli are liable to be found in the stools of convalescents even long afterward. These facts discredit the value of bacteriologic examination. The serum reaction is, further, not absolutely reliable evidence in regard to the etiology of a given affection supposed to be typhoid, as its findings vary so inexplicably. He remarks that "the confusion that can be induced by inadequate clinical observation and uncritical etiologic diagnosis is well shown by the literature published during the last few years on paratyphoid affections. Most of these paratyphoid cases are not typhoids with a special etiology, but merely affections interesting on account of the peculiar reaction on the part of the blood serum. Some were probably ordinary typhoid, others had nothing whatever to do with typhoid. Other cases have been observed which did not differ from typhoid in any respect, although they were caused by the Schottmüller instead of the Eberth bacillus. Typhoid fever is thus apparently not an etiologic unit, and it is merely splitting hairs whether we call the cases of typhoid not caused by the Eberth bacilli, paratyphoid, or whether we include them in the term typhoid with merely some additional term to express their etiologic peculiarity. We can speak of a typhoid with a special etiology only when the symptoms of typhoid are present and Eberth's bacillus as the cause of the disease can be definitely excluded. This is the only means to bring order out of the present confusion, the result of insufficient clinical observation and over-hasty deductions, and show whether typhoid fever should be separated into several distinct diseases."

50. **Relief of the Kidneys by Sweating.**—Strauss has been studying this subject on a large amount of material, comparing the findings by groups of patients with various affections. He obtained the sweat for the purpose by the use of dry heat, a rubber sleeve fitting over the arm, a faucet in the sleeve bag allowing all the accumulated fluid to be drawn out into a vessel below. Out of 200 tests he was able to obtain enough sweat for comparative research only in 80. In 25 of these 80 subjects some serious renal trouble existed; the others were patients for whom sweating procedures had been ordered generally on account of some neuralgic or rheumatic trouble. The findings showed that the molecular concentration of the blood was frequently higher in the nephritic than in the non-nephritic subjects, especially in the uremic nephritics. The retention of water in cases of purely nephrogenic edema fulfills a compensatory purpose, as it serves to dilute the retained salts and other débris of metabolism. The end products of nitrogen metabolism are not so important for the origin of the edema as the salts, yet the poisonous substances which cause the uremia must be sought among them, although we are not yet able to define them. The pathologic importance of the retention of salts is demonstrated in another direction from that of the retention of the end products of nitrogen metabolism. There is scarcely any department of internal medicine in which such opposite views prevail as in this question of the efficacy of sweating procedures for the elimination of nitrogenous molecules. In the tests here described these molecules were in proportions in half the cases of nephritis far beyond that attained in three-quarters of the non-nephritic cases. The amount of total nitrogen was generally somewhat larger than in the subjects with sound kidneys. The practical conclusions of the research reported are to the effect that sweating procedures are liable to be beneficial in nephritis, and that uremic accidents need not be specially feared. It is advisable, however, to supplement the sweating by copious ingestion of water to prevent evil consequences from the diaphoresis in uremic subjects. If the edema increases, this is a minor ill, and the superfluous fluid can be easily tapped. Strauss' experience has not shown that sweating had any influence in favoring the outbreak of uremic accidents. On the contrary, his impression is that uremic subjects are improved by it, his empiric observation confirming the results of his research here presented.

53. **Carbonic Oxid Poisoning.**—In the first of the 2 cases reported the man had worked in an imperfectly ventilated room in which coke stoves were burning. He suddenly presented symptoms suggesting a focus of softening or hemorrhage in the left hemisphere. The permanent motor aphasia justifies the assumption that this focus involved the region of the foot of the anterior central convolution. A history of mild syphilis a few years before suggests that the part may have been predisposed. In the second case, the symptoms were about the same, but rapidly retrogressed. An accident to the woman's skull a year or so before may have afforded a predisposition. She exhibited likewise cyanosis and edema of both hands, knee and forearms, with pemphigus-like blisters, subsiding by the tenth day, all but two rows of blisters on the right forearm, which terminated in necrosis, healing finally after several weeks. They were evidently due to a neuritic process. The poisoning occurred in consequence of shutting the damper in the stovepipe. She and her husband were taking coffee together, when she lost consciousness and was not found until after twenty-six hours. The husband was dead.

57. **Removal of Urates and Capsule from Gouty Toe.**—In 1882 Riedel was summoned to operate on a great toe which had suddenly become swollen and intensely painful after a day's hunting, the subject a previously entirely healthy man of 45. The aspect of the toe suggested hallux valgus and suppuration in a bursa. Under narcosis Riedel incised, searching for the assumed bursa, but nothing of the kind was found, merely a typical gouty deposit of urates, the capsule congested and set with pointed urate crystals. He was horrified to find that he had operated on a gouty toe, but, having it open before him, proceeded to remove all the urates and extirpated also the capsule. The patient was relieved at one stroke from his excruciating pain, and during the twenty-two years since has had no further trouble of the kind. He was so grateful that he went about advising other subjects with podagra to submit to an operation, but none heeded him and twelve years passed before Riedel had an opportunity to operate on another case of the kind. The diagnosis in this second case had been similarly mistaken, bursitis with secondary suppuration having been assumed. The results were as perfect as in the first case. Of course this operative treatment should be restricted to isolated podagra, involving only a single toe. But the results were so encouraging in his 2 cases that he can not refrain from advocating such a procedure in case of rebellious, excruciatingly painful gout, isolated at a single point. The great toe is easily accessible, and at the same time very resistant. Extensive detachment of the capsule does not impair its nutrition if the wound is left open. In a gouty joint the inflammation is aseptic, the exudate merely serous. If a recurrence should develop, the simple operation could be readily repeated. In any event, the patient can count on years of peace in the interim.

59. **Spontaneous Healing of Cancer.**—Borrmann has examined histologically 265 cutaneous carcinomata, with over 2,000 microscopic sections, and has frequently found the so-called foreign body giant-cells. But he does not admit that these giant-cells are an indication of healing of the lesion. They do not take up living cells, but merely form around dead detritus. They were seldom or never found among the living cells of the cancer. In 80 cases the lesion was an ulcus rodens, and giant-cells were numerous, yet these lesions are inevitably slowly progressive. In his experience the giant-cells were more numerous in the rapidly growing cancers. Deported cancer cells undergo horny transformation, and when killed by this process are then taken up by the giant-cells. The latter respect them so long as they are alive.

62. **Menstruatio Precox.**—Stein was called to a babe of 6 months, as genital hemorrhage was noted. It recurred regularly month after month under the aspect of menstruatio precox. He gives an illustration of the child at fourteen months, the menstruation having recurred eight times, and, curiously, always coinciding with that of the mother.

64. **For Mosquito Bites.**—Schill recommends to apply a little sodium bicarbonate, moistened to a paste, to take the sting out

of a mosquito bite. It may be used in a concentrated solution. To drive the insects away, he swabs the exposed parts with a 2 per cent. solution of thymol. He has found these measures very effectual against mosquitoes and gnats.

65. **Madeira as a Health Resort.**—The Madeira Islands offer a combination of sea air, hill and mountain climate, freedom from dust and climatic vicissitudes, remarkably beautiful scenery and luxuriant vegetation, which make it a most promising health resort. As has been mentioned in the news columns, a company has been formed to exploit Madeira for this purpose. It will be possible there to have a tuberculous subject try different climates and altitudes under the supervision of a single physician, to determine which is best suited for him. No research of this kind has yet been undertaken. It is planned to make the sanitation of the island chosen ideal, to have three sanatorium hotels at different elevations, with possibly a floating sanatorium, and to spare no pains to make it a perfect health resort, according to the most advanced ideas. The names of Pannwitz and Wölff guarantee the high scientific character of the undertaking.

68. **Kehr's Operation on Waldeck-Rousseau.**—(See page 823.) The patient was a man of 58, always healthy until icterus developed suddenly last fall after a violent emotion. There was no pain, but the icterus continued with varying intensity until the spring, when there was gradual loss of appetite and strength. An operation was undertaken, the abdomen opened, and through a small incision at the outer margin of the right rectus the surgeons (Poirier and Terrier) palpated a small, hard lump in the head of the pancreas. Without further exposure of the cystic and bile duct or of the pancreas, they made an anastomosis between the gall bladder and the jejunum. The gall bladder was large and adherent and its contents were thick and gelatinous. A week later there were three cholemic hemorrhages from the wound, but the icterus, pruritis and lack of appetite persisted. Two months after the operation the icterus was still the same as before, the only change being that the patient was weaker and more miserable. When Kehr was summoned he found an emaciated, extremely icteric patient, drowsy and already standing under the sign of cholemic intoxication. No pain could be elicited by palpation, the liver was enlarged but smooth and nowhere hard; there was no ascites and no tumor. The pulse was regular and strong, 84. The urine contained a large proportion of bile pigment, but no sugar nor albumin; the feces were completely decolored. The family physicians said that the heart and lungs were sound. Kehr diagnosed chronic occlusion of the common bile duct, but whether from a stone or tumor, pancreatitis or adhesions it was impossible to say. His experience with 947 gallstone operations had been that a cancer had been found in 70 per cent., a stone in 10 per cent. and chronic pancreatitis in 20 per cent. The findings in the case showed that the anastomosis of the previous operation had not accomplished its purpose. The cystic duct may have been compressed by adhesions, which would explain the non-functioning of the anastomosis. Kehr's practice is always to aspirate the contents of the gall bladder before opening it. It is then incised and its contents evacuated. Only when bile flows from the cystic duct is anastomosis permissible. If the cystic duct be impermeable, then cystostomy, or, better still, choledochoduodenostomy should be considered. Eventually cholecystectomy may be done, supplemented by an anastomosis between the common duct and the duodenum. In any event, a long incision should be made to enable the conditions in the ducts to be ascertained correctly. In the case in question the cystic duct may have been impermeable at the time of the first incision or may have become so later. The patient had not lost his icterus, and an operation was the only resource left, as he and his friends appreciated. The age and sex spoke in favor of carcinoma, also the almost painless course of the trouble (possible likewise in case of stones), the severe icterus (possible in case of stone in the papilla), and the cachexia (possible also in case of occlusion from stone). Evidence against cancer was the sudden appearance of the icterus, its fluctuations and the comparatively long course of the affection. Cases of scirrhus of the pancreas are known which have run a two-year course. The patient was doomed without an operation, and if the trouble was of a non-malignant nature it might cure, and, if malignant, it might prove palliative. The chances were 30 per cent. in favor of the former. The patient was too weak to be taken to a hospital. The abdomen was opened and a rather hard tumor was found in the pancreas behind the duodenum, studded with nodules, in all probability a carcinoma. But, as chronic pancreatitis can induce a similar tumor formation, there was a possibility of this, especially as the glands were not enlarged and there was no trace of ascites. On the strength of this possibility Kehr regarded it as his duty to provide for the evacuation of the stagnating bile. A lobe of the liver presented and was taken for the gall bladder and incised, the 1 cm. incision lengthening the operation by five minutes. The gall bladder was found lax and almost empty, containing merely a little secretion and an undigested scrap of melon. The cystic duct was completely occluded. It had taken an hour to reach this point, and the patient showed signs of collapse. A tube was inserted in the gall bladder and an incision made in the common duct above the duodenum, the bile spurting in a stream. At this sudden evacuation of the liver the signs of collapse increased, and the intended choledochoduodenostomy or anastomosis between the gall bladder and common duct had to be abandoned. Kehr had to content himself with draining the hepatic duct, tamponing and closing the abdomen, concluding the intervention in seventy-five minutes. On account of the extensive adhesions it was one of the most difficult operations he has ever done. The patient was placed in bed, the pulse grew a little stronger, but after an hour disappeared, and death ensued before the second hour. One of the lessons learned from this instructive case, he adds, is the value of a hospital environment. Everything had presumably been prepared, but the surgeon felt the lack of light from above; he missed his adjustable operating table and the oxygen-chloroform apparatus to which he was accustomed, although he had brought his own anesthetist with him.

70. **Beck's Method of Operating on Hypospadia.**—Bätticher reviews 10 cases in which Beck's method was followed, the results compelling him to urgently corroborate König's assertion that the Beck technic has superseded all other methods of treating hypospadia. The results are just as brilliant in very young children, but on account of the soiling of the parts during infancy the Giessen clinic has adopted the rule not to operate in cases of hypospadia until after the child is in its third year.

71. **Rupture of Bladder During Bottini Electrolysis of Prostate.**—Rosenstein describes a case of prostatic retention treated at Israel's clinic by Bottini electrolysis according to the usual technic. During the process the bladder ruptured with the sound of an explosion. Experimental research since suggests that the steam generated by the heat of the cautery was responsible for the explosion of the bladder. He reproduced similar conditions in glass vessels and in rabbits' bladders, and found that an explosion followed the "Leidenfrost" phenomenon (the dancing of the drops of moisture on the white-hot knife, isolated by their steam), and the sudden evaporation into steam as soon as the knife is cooled to a certain point by contact with the tissues. He sees no way to obviate this disaster in performing the Bottini operation, and thinks that the danger from it should turn the scale in favor of prostatectomy.

Gazzetta degli Ospedali, Milan.

Last indexed page 926.

76 (XXV, No. 61.) Honors to C. Bozzoli.
77 Sulla presenza del peptone du Kühne nell' orina. L. Borelli.
78 *Sul potere saccarificante del sangue in condizioni normali e patologiche. R. Vigliani.
79 Contributo allo studio dei tumori maligni nel seno mascellare (in male breast). V. Ingraldi.
80 *Varia sintomatologia del carcinoma gastrico. G. Marelli.
81 (No. 64.) *Sull' inizio anomalo di alcune infezioni. A. Campani.
82 La dissociazione delle sensibilità elementari nell' emiplegia. P. Ferri.
83 Contributo alla cura ed alla etiologia del vomito incoercibile delle gravide. F. Scaramucci.
84 Gravissimi riflessi nervosi in gravidanza fisiologica. Opoterapia tiroidea Guarigione. V. Valerio.

85 (No. 67.) *Per la ricerca dei bacilli tubercolari. C. Tarchetti.
86 La sutura ossea nelle fratture della clavicola. G. Baroni.
87 *Nuovo contributo alla tecnica della ipodermoclisi e delle iniezioni endovenose. L. A. Oliva (Genoa).
88 Sublimato corrosivo e tubercolosi. A. Monari.
89 Contributo clinico allo studio dell' osteite vertebrale postiliaca. A. Germani.
90 (No. 70.) *Bulli' iperglobulia dei tubercolosi. S. Mircoli.
91 *Sulla genesi tubercolinica delle iperglobulie tubercolari. S. Rebaudi and L. Alfonso.
92 Di un epidemia di disturbi intestinali da un colibacillo virulento nell' acqua potabile. L. Vincenzo.
93 Il siero Maragliano Nella profilassi e nei casi incipienti della tubercolosi. S. Calasuonno.
94 Le iniezioni intramuscolari di antipirina nelle nevralgie ischiatiche. S. Pascholetti.
95 Goiter and Fatigue. T. di Giuseppe.—Gozzo e fatica.
96 Contributo alla diagnosi di eclampsia in gravidanza. S. Pascoletti.
97 Azione antinevralgica e antitermica della morfina nelle nevralgie tubercolari. M. Bellotti.

78. Increase in Sugar-Forming Property of Blood.—Vigliani does not attempt to explain this phenomenon, but states that it occurred constantly in his experiments. By modifying the metabolism, either with phloridzin or phosphorus, the sugar-forming property of the blood serum was much augmented.

80. Symptomatology of Gastric Cancer.—Several puzzling cases are described. In one there was no absence of HCl, while no tumor nor specific formed elements could be discovered. The diagnosis was based on the lack of appetite, repugnance for meat, absence of the signs of perforation and of vomiting after eating, the dry, straw-colored skin, the cachexia and progressive character of the symptoms which suggested gastric ulcer. In a second case the symptoms indicated stenosis of the pylorus, but there was no vomiting and no HCl. In a third case the symptoms were those of pernicious anemia, but the progressive cachexia, the difficulty in ingesting solid foods and the pains in the intrascapular region suggested a cancer in the lesser curvature. The cancer in his fourth patient induced intermittent fever, probably from absorption of toxic products. A psychosis was the first signal of trouble in this case, soon followed by the discovery of a tumor in the stomach.

81. Unusual Onset of Certain Infections.—Several cases of typhoid, pneumonia and erysipelas are described, in all of which the first manifestations were identical, all of a gastro-nervous type. They included vomiting, diarrhea, colic, unconsciousness, pupil inertia, clonic convulsions, etc. Nothwithstanding the severity of the onset, the after-course was unusually mild in some of the cases.

85. Simple Stain for Tubercle Bacilli.—Among the causes of failure to show up tubercle bacilli, Tarchetti mentions defective preparation of the material, imperfect staining and the unfounded notion that a contrast stain is necessary. He uses a simple technic, which includes spreading the material in a thin, even layer on cover-glasses, fixation with heat, staining with phenic fuchsin or Ziehl's (fuchsin, 1 part; alcohol, 10; phenic acid, 5, and water, 100), applied hot for ten to fifteen minutes, rinsing, decoloring for one or two minutes in a concentrated alcoholic solution of picric acid, changing the liquid once. The process concludes with brief rinsing, drying and mounting in balsam. The advantages of this technic are its simplicity and the mild action of the picric acid, while the persistence of the yellow stain gives the impression of contrast staining.

87. Technic of Subcutaneous and Intravenous Injections.—Oliva described, two years ago, an instrument for this purpose, and his experience has impressed him more and more with its advantages. The needle is enclosed in a canula, which protects against its penetrating too far. The tube connecting it with the fluid to be injected is enclosed in a larger tube through which there is a constant flow of hot water. The simple apparatus is illustrated in detail.

90. Hyperglobulia in Tuberculosis.—This article has been noticed editorially, page 742. Mircoli noticed that a certain patient with incipient tuberculosis had six million red corpuscles. The aspect suggested anemia rather than hyperglobulia. These findings were repeated in a number of other cases of slight sclerosis of the apices. Pondering on this remarkable hyperglobulia in apparently anemic subjects, he came to the conclusion that it was due to the action of small amounts of tuberculin, such as are produced by a small, circumscribed, inactive tuberculous focus. Arsenic in small amounts promotes the regeneration of the blood, and he queried whether tuberculin might not have a similar action. Experimental researches on animals treated with small doses of tuberculin have confirmed the correctness of this assumption. He refers to Swan's report of hyperglobulia observed in 8 out of 26 tuberculous subjects examined (THE JOURNAL, xlii, March 12), and explains the scarcity of such findings by the general impression that the pallor of consumptives is evidence against hyperglobulia. In reality, the color of the skin depends on the pigmentation and the activity of the capillary circulation. It has nothing to do with the number of the red corpuscles. Another reason is that the blood is seldom examined in the incipient phases of tuberculosis. When the patients come to the clinics this phase is long past. Many influences are known that reduce the number of reds, and there is nothing strange in the fact that other influences may increase them. Among such influences must be reckoned the action of the tuberculin generated in some small, torpid process in the spleen or lungs. In a recent case a patient with sclerosis of the apices had hemoptysis of a pint of blood twice, with ten days' interval. The day after the second hemorrhage the reds numbered 5,600,000. Hyperglobulia in incipient tuberculosis is a means of differentiating an active from a torpid process. The hyperglobulia that follows hemoptysis is an argument in favor of venesection as an effectual measure against certain of the symptoms of tuberculosis.

91. Tuberculin as Stimulus to Production of Red Corpuscles.—This article relates the particulars of the research referred to in the preceding abstract. The writers found that large doses of tuberculin injected into guinea-pigs had a very destructive action on the reds. Moderate doses had no apparent effect on the reds, but repeated, small doses induce pronounced hyperglobulia. The hemoglobin increased parallel with the number of the reds. This effect was apparent in a few days, and persisted for some time. It was so marked that the writers suggest that it might be utilized in the therapeutics of non-tuberculous affections. Subcutaneous injection of minute "refractory" doses of tuberculin might prove an effective measure in combating non-tuberculous anemia and chlorosis. In such small doses tuberculin is perfectly harmless, and it is being tested now in the clinic.

Books Received.

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

HANDBOOK OF SURGICAL ANATOMY. By G. A. Wright, B.A., M.B. (Oxon.), F.R.C.S., Professor of Systematic Surgery in the Owens College, and C. H. Preston, M.D., B.S. (Lond.), F.R.C.S., L.D.S. (Eng.), Lecturer on Dental Anatomy in the Owens College. Cloth. Pp. 202. Price, $1.50 net. Philadelphia: P. Blakiston's Son & Co. 1904.

REGIONAL MINOR SURGERY, Describing the Treatment of Those Conditions Daily Encountered by the General Practitioner. By George Gray Van Schaick, M.D., Consulting Surgeon to the French Hospital, N. Y. Cloth. Pp. 226. Price, $1.50. New York: International Journal of Surgery Co.

EPITOME OF NERVOUS AND MENTAL DISEASES. A Manual for Students and Physicians. By Joseph Darwin Nagel, M.D., Consulting Physician to the French Hospital, New York. With 46 Illustrations. Cloth. Pp. 276. Price, $1.00 net. Philadelphia and New York: Lea Brothers & Co. 1904.

KIRK'S HANDBOOK OF PHYSIOLOGY. Revised by Frederick C. Busch, B.S., M.D., Professor of Physiology, Medical Department, University of Buffalo. Fifth American Revision. With 535 Illustrations, Including Many in Colors. Cloth. Pp. 862. Price, $3.00. New York: Wm. Wood & Co. 1904.

STUDIES FROM THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH. Reprints. Paper. Volume II, 1904. Bacteriological and Clinical Studies of the Diarrheal Diseases of Infancy with Reference to the Bacillus Dysenteriæ (Shiga). Edited by Simon Flexner, M.D., and L. Emmett Holt. 1904.

STRABISMUS, or SQUINT, Latent and Fixed. A Supplement to the Errors of Refraction. By Francis Valk, M.D., Professor of Diseases of the Eye, New York Post-graduate School and Hospital. Cloth. Pp. 171. Price, $1.75. New York and London: G. P. Putnam's Son. 1904.

EIGHTH ANNUAL REPORT OF THE MANHATTAN STATE HOSPITAL at New York to the State Commission in Lunacy, for the Year Ending Sept. 30, 1903. Albany: J. B. Lyon Co. 1904.